

# AUBURN UNIVERSITY

Fully accredited by the  
Southern Association of Colleges  
and Schools



ALABAMA'S  
LAND-GRANT  
UNIVERSITY

AUBURN, ALABAMA 36830

1969-70

CATALOG NUMBER

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Auburn University graduate  
in Visual Design

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## AUBURN UNIVERSITY BULLETIN

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APRIL, 1969

NUMBER 4

1969	UNIVERSITY CALENDAR
<b>JULY</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>1969—Summer Quarter</b> (48 class days) and <b>Eight-Week Term</b> (38 class days) May 20, <i>Tuesday</i> .....Last day for completing applications June 10-11, <i>Tues.-Wed.</i> .....Final Registration June 11-12, <i>Wed.-Thurs.</i> .....Sched. Adjustment June 12, <i>Thursday</i> .....Classes begin June 12-17.....Special examination period July 4, <i>Friday</i> .....Independence Day, Holiday July 16, <i>Wednesday</i> .....Mid-quarter July 14-24.....Registration for Fall Quarter August 5, <i>Tuesday</i> .....Classwork ends for term August 6-7, <i>Wed.-Thurs.</i> .....Final exams for term August 19, <i>Tuesday</i> .....Classwork ends for quarter courses August 20-22, <i>Wednesday</i> through <i>Friday</i> .....Final examinations for quarter courses August 23, <i>Saturday</i> .....Graduation, 2:30 p.m.
<b>AUGUST</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	
<b>SEPTEMBER</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	<b>1969—Fall Quarter</b> (50 days) August 26, <i>Tuesday</i> .....Last day for completing applications for admission September 17-19, <i>Wed.-Fri.</i> .....Final registration September 19-22, <i>Friday - Monday</i> .....Schedule Adjustment Period September 22, <i>Monday</i> .....Classwork begins September 22-25.....Spec. exams October 24, <i>Friday</i> .....Mid-quarter October 27 - November 6.....Registration for the Winter Quarter October 28, <i>Tuesday</i> .....General Faculty Meeting Nov. 24-29, <i>Mon.-Sat.</i> .....Thanksgiving Holidays December 1 - 5.....Schedule distribution and fee payment for Winter Quarter December 5, <i>Friday</i> .....Classwork ends December 8-11, <i>Mon.-Thurs.</i> .....Final exams December 12, <i>Friday</i> .....Graduation, 2:30 p.m.
<b>OCTOBER</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	
<b>NOVEMBER</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	
<b>DECEMBER</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>1970—Winter Quarter</b> (48 days) December 15, <i>Monday</i> .....Last day for completing applications for admission January 5, 6, <i>Monday - Tuesday</i> .....Final registration January 6, 7, <i>Tuesday - Wednesday</i> .....Schedule Adjustment Period January 7, <i>Wednesday</i> .....Classwork begins January 7-12.....Spec. exams February 2 - 12.....Registration for the Spring Quarter

# UNIVERSITY CALENDAR

1970

February 10, *Tuesday*.....Mid-quarter  
 March 9 - 13.....Schedule distribution and  
 fee payment for Spring Quarter  
 March 13, *Friday*.....Classwork ends  
 March 14-18, *Sat.-Wed.*.....Final exams  
 March 19, *Thursday*.....Graduation, 2:30 p.m.

## 1970—Spring Quarter (48 days)

March 4, *Wednesday*.....Last day for completing  
 applications for admission  
 March 25, *Wednesday*.....Final registration  
 March 25 - 26, *Wednesday -*  
*Thursday*.....Schedule Adjustment Period  
 March 26, *Thursday*.....Classwork begins  
 March 26-31.....Spec. exams  
 April 27 - May 7.....Registration for Summer  
 and Fall quarters  
 April 28, *Tuesday*.....General Faculty Meeting  
 April 29, *Wednesday*.....Mid-quarter  
 May 28 - June 2.....Schedule distribution and  
 fee payment for Summer Quarter  
 June 1, *Monday*.....Classwork ends  
 June 3, 4, 5, 8, *Wed.-Mon.*.....Final exams  
 June 9, *Tuesday*.....Graduation, 2:30 p.m.

## 1970—\*Summer Quarter (48 class days) and Eight-Week Term (38 class days)

May 25, *Monday*.....Last day for completing  
 applications for admission  
 June 15, 16, *Monday - Tuesday*.....Final  
 registration  
 June 16, 17, *Tuesday - Wednesday*.....Schedule  
 Adjustment Period  
 June 17, *Wednesday*.....Classwork begins  
 June 17-22.....Spec. exams  
 July 3, *Friday*.....4th of July Holiday  
 July 13 - 23.....Registration, Fall Quarter  
 July 21, *Tuesday*.....Mid-quarter  
 August 11, *Tuesday*.....Classwork ends for term  
 August 12 - 13, *Wednesday - Thursday*.....Final  
 examinations for term  
 August 25, *Tuesday*.....Classwork ends for quarter  
 August 26, 27, 28, *Wed.-Fri.*.....Final exams  
 August 29, *Saturday*.....Graduation, 2:30 p.m.

NOTE: Schedule distribution and fee payment for the Fall  
 Quarter will be accomplished by mail prior to the  
 opening of the quarter.

\*All dates in the Summer Quarter are tentative and are  
 subject to final approval prior to 1970-71 catalog printing.

## JANUARY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
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## FEBRUARY

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## MARCH

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29	30	31				

## APRIL

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## MAY

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31						

## JUNE

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

# Board of Trustees

Under the organic and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an ex-terra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are ex-officio members. The Governor is chairman. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

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*Assistant to the President*

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*Director of University Relations*

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# The University

## History

Auburn University was chartered February 1, 1856, as the Methodist-sponsored East Alabama Male College, and the formal opening took place October 1, 1859. The Civil War interrupted the college's growth in 1861, and except for the preparatory department, the institution suspended operation, reopening in 1866.

Beset with financial problems, the college was presented to the State of Alabama by the Methodist Church on February 26, 1872. Having accepted the Morrill or Land-Grant College Act of 1862 in 1866, the Alabama Legislature received the gift of the campus and facilities and established the Alabama Agricultural and Mechanical College at Auburn. This was the first land-grant college in the South established separate from the state university.

Auburn first admitted women students in 1892.

Following an earlier action of the Board of Trustees, the Legislature, in 1899, changed the name of the institution to The Alabama Polytechnic Institute, justifying the change on the college's broadened program of teaching the sciences and arts as well as branches related to agriculture and the mechanic arts.

Auburn has experienced its greatest growth and development since World War II with over three-fourths of the 14,049 students enrolled currently in the Schools of Education, Engineering, Arts and Sciences, Business, and the Graduate School.

From the beginning, the name of the city — drawn from Goldsmith's immortal line, "Auburn, loveliest village of the plain" — has been used to designate the institution. Recognizing this fact and the expanded academic program, the Alabama Legislature changed the name of the institution to Auburn University on January 1, 1960.

One of the largest institutions in the South today, Auburn University has increased its enrollment from 80 in 1859 to 14,049 in the fall of 1968. The original plant consisted of a single building and 16 acres. Expansion has resulted in a multi-million dollar plant comprising 56 main buildings and 1,871 acres on the main campus. The University's Agricultural Experiment Station owns an additional 16,814 acres of land at substations and units over the state. Through its divisions of Instruction, Research and Extension, Auburn University touches the life of nearly every Alabama family.

The City of Auburn is in Lee County. Incorporated in 1838, it is 60 miles east of Montgomery, 120 miles southeast of Birmingham, and 125 miles southwest of Atlanta, Ga. It sits astride the junction of the Piedmont plateau and the Coastal plains at an elevation of 732 feet and enjoys moderate temperatures throughout the year. The city has an area of about 20 square miles and a population of approximately 20,000.

## *Purposes of Auburn University*

To maintain a community of learning where knowledge may be preserved, disseminated, and increased. (This is the fundamental purpose of all universities. To the extent that it fulfills this basic purpose of a university, Auburn University will fulfill its several particular purposes which are listed below.)

To provide the opportunity to all qualified young people of the State, regardless of their economic or social background, for a liberal and practical education.

To provide the State, the region, and the nation with educated young people who have the disciplined minds, the knowledge, and the skills to contribute needed leadership and services to society and who will help perpetuate the moral and political values upon which our society is based.

To conduct a broad program of public and private research, basic and applied, for the general increase of human knowledge, for the benefit of society in meeting its scientific, economic and social problems, and for the stimulation of the faculty and students in their quest for knowledge.

To carry knowledge and its benefits to the people of the State by means of extension programs and the use of the mass media of communications in order to help all citizens improve their technical and cultural capabilities.

To conserve our cultural heritage through support of scholarly and creative work in the humanities, social sciences, and the arts so that the University may serve both students and citizens of the State as a focal center where the cultural traditions of our civilization are kept alive and transmitted to the future.

To engage constantly in an examination of the particular objectives, goals and programs of the University in the light of new knowledge and of changing social conditions; and as a part of this constant re-examination, to seek ever more efficient and economical means of fulfilling the University's purposes.

## *Functions*

The official seal of Auburn University carries three words, Instruction, Research, and Extension, indicating the three functional areas through which the institution operates as the State's Land-Grant University.

### **Instruction**

The University's instructional purpose is twofold: to stimulate the student to reach his full potential as a human being through a respect for intellectual inquiry and an understanding of the cultural tradition of which he is a part; and to provide him with the knowledge and skills

that will allow him to make his way successfully in a demanding and practical world.

The undergraduate curriculum at Auburn University is therefore conceived as a process wherein general and specialized studies are harmonized to produce a graduate (a) who has pursued one study area in depth (conventionally, the departmental major) for vocational or professional ends; but (b) who has also undergone intellectual experiences in representative academic disciplines: mathematics and the natural sciences, the humanities, and the social sciences.

Thus each student at Auburn University must complete, in addition to the "depth" requirements of his specialized area, a program of liberal education studies comprising approximately 25 percent of the total number of hours in his bachelor's degree program. The minimal University liberal education program is described in detail under "Academic Regulations," page 48.

The baccalaureate degree is offered by the nine undergraduate academic schools incorporated in Auburn University, including 63 departments for specialized study. Master's and doctoral degrees are offered through the School of Graduate Studies. Military instruction is offered through programs in Air, Military, and Naval Science.

## Research

The land-grant college upon its inception accepted responsibility for discovering and organizing knowledge in agriculture and related fields largely because of lack of subject matter for instruction.

The purposes of research suggested in the Hatch Act of 1887 provided for establishment and support of the Agricultural Experiment Station. Its objectives were to conduct research bearing on the agricultural industry, to aid in acquiring information on subjects connected with agriculture, and to promote scientific investigation into the principles and applications of agriculture.

In 1929 the Engineering Experiment Station was established to assist industries in the State to improve manufacturing processes and to study undeveloped natural resources and methods by which they may be converted into marketable products. Its services are available to industry, governmental agencies, and to citizens of the State.

In 1944 a Research Council was formed to further research, to discover and develop research talent, to cooperate with all agencies for the betterment of the South, to foster and encourage learning in natural science, social science, the humanities, agriculture and engineering, and to promote liberal and practical education in the several pursuits of life.

The Water Resources Research Institute was established in 1963 to stimulate and sponsor water resources research and the training of scientists in water and other resources as they affect water.

The Nuclear Science Center was completed in 1967. This facility provides research and teaching space for use by all departments for work in all phases of the pure and applied aspects of the nuclear science field. Work is being done in the areas of agriculture, chemistry, engineering, home economics, pharmacy, physics and veterinary medicine.

In 1967 the Office of Contract and Grant Development was established within the Office of the Vice President for Research to coordinate and service University policies and procedures relating to extramural programs in instruction, research, and extension, and to handle the activities formerly handled by the Auburn Research Foundation. Auburn's fastest expanding research area is sponsored research — contract and grant research supported by Federal, State, Foundation, and private agencies in all units of the institution.

The continuing objectives of the University are to further the frontiers of knowledge in all areas and to discover new and better ways of doing things through broadened programs of research.

Every academic school on the Auburn campus is involved in research. Auburn's faculty and graduate students are actively increasing man's understanding of man and the world in which he lives. In the sciences, the quest is for new knowledge. In the arts, humanities, and social sciences, the search is for new meanings.

While University interests are in applying scientific study and findings to current problems, equal interests exist in preparing scholars, thinkers, and workers for the future, and leaders competent in the use of the fruits of research.

The growth and development of University research parallels that of graduate enrollment. Individual research by faculty members and graduate students is encouraged and extensive programs of basic and applied research are continually expanding throughout the institution.

## Extension

The development and implementation of extension programs is one of Auburn University's major responsibilities. Programs are designed to enable the University to provide a wide variety of educational services to farms, homes, industries, communities, and municipalities throughout Alabama. Over the years, Auburn University, by lectures, publications, demonstrations, and other educational methods, has extended the results of research and instruction and countless other services to the people of Alabama.

The Cooperative Extension Service is the oldest of the formally organized Extension Services at Auburn University. It was created by the Smith-Lever Act passed by the National Congress in 1914. Educational programs implemented by the Cooperative Extension Service are conducted in accordance with a Memorandum of Understanding between Auburn University and the United States Department of Agriculture. Programs in each of the 67 Alabama counties are conducted under a Memorandum of Understanding between Auburn University and the county governing body.

Cooperative Extension Service programs are organized broadly around agriculture, marketing, home economics, youth activities, community improvement and resource development.

The Engineering Extension Service was established in 1937 to implement educational programs developed in the School of Engineering

and to provide educational services which would more adequately meet the needs of industries in the state. Programs of this service include short courses, conferences, workshops, and other methods of extending technical assistance to Alabama industries.

Extension programs are also conducted through the Extension Division by the Schools of Architecture and Fine Arts, Arts and Sciences, Business, Education, Pharmacy, and Veterinary Medicine. In addition, Educational Television presents public service programs, and the Ralph Brown Draughon Library works cooperatively with city, county and regional libraries to make literary materials available to people throughout the State.

In all of its extension and service programs, Auburn University continuously strives to serve the people, communities, and industries of Alabama more adequately by relating its competencies to their needs.

## *The Academic Program*

### **Fields of Study**

Auburn University offers work in many fields. The student has an opportunity for specialization and the pursuit of particular interests in the several Schools including the Graduate School.

For instructional purposes, the University is organized into the following Schools: Agriculture, Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, Home Economics, Pharmacy, Veterinary Medicine, and the Graduate School.

Instruction is given in each School through four quarters of approximately 11 weeks each.

Resident instruction in the University is offered through Schools and Departments as indicated below. Regular curricula offered and degrees conferred by the several Schools are also listed.

**School of Agriculture**, includes the Departments of Agricultural Economics & Rural Sociology, Agricultural Engineering, Agronomy and Soils, Animal Science, Botany and Plant Pathology, Dairy Science, Forestry, Horticulture, Poultry Science, and Zoology-Entomology. Curricula offered are: *Agricultural Science, Agricultural Business and Economics, Agricultural Engineering, Biological Sciences, Food Science, Forest Management, Ornamental Horticulture and Wood Technology*. Within each curriculum students are permitted to major in line with their special interests.

Degrees: Bachelor of Science in Agricultural Science, Agricultural Business and Economics, Agricultural Engineering, Biological Sciences (Botany, Entomology, Fisheries Management, Wildlife Management, Zoology), Food Science, Forestry, Ornamental Horticulture, and Wood Technology.

**School of Architecture and Fine Arts**, includes the Departments of Architecture, Art, Building Technology, Music, and Theatre. Curricula offered are: *Architecture, Building Construction, Fine Arts, Industrial*



*Design, Interior Design, Music (Majors in Applied Music, Church Organ Music, Music History and Literature, Theory and Composition) Theatre, and Visual Design.*

Degrees: Bachelor of Architecture, Arts, Building Construction, Fine Arts, Industrial Design, Interior Design, Music.

**School of Arts and Sciences**, includes the Departments of Chemistry, English, Foreign Languages, Geology, History, Laboratory Technology, Mathematics, Philosophy, Political Science, Physics, Psychology, Sociology, and Speech. Curricula offered are: *The General Curriculum (Majors in Humanities, and Natural and Social Sciences), Pre-Professional (Pre-Law, Pre-Dentistry, Pre-Medicine, Pre-Pharmacy, and Pre-Veterinary Medicine), and Special Scientific (Geology, Mathematics, Physics, Applied Physics, and Psychology).*

Degrees: Bachelor of Arts and Bachelor of Science.

**School of Business**, includes Departments of Economics, Finance and Accounting, Management and Marketing and Transportation.

Degrees: Bachelor of Science.

**School of Education**, includes the Departments of Elementary Education; Foundations of Education; Secondary Education; Administration, Supervision, and Guidance; Health, Physical Education and Recreation; Vocational, Technical and Practical Arts Education. Undergraduate curricula offered are: *Elementary Education, Secondary Education (majors or minors in Art; Business Education; English; Health, Physical Education and Recreation; Vocational Home Economics; Mathematics; Mental Retardation; Modern Languages; Music; School Library Science; Science; Social Science; Speech; and Speech Correction), Theatre, Vocational, Technical, and Practical Arts Education (majors in Agricultural Education, Basic Vocational Education, Distributive Education, and Trades and Industrial Education).*

Degrees: Bachelor of Science in Education.

**School of Engineering**, includes the Departments of Pre-Engineering, Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Graphics, Industrial Laboratories, Industrial Engineering, Mechanical Engineering, Textile Engineering. This School offers curricula in *Aerospace Engineering, Aviation Management, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Metallurgical Engineering, Textile Chemistry, Textile Engineering, and Textile Management.*

Degrees: Bachelor of Aerospace Engineering, Aviation Management, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Metallurgical Engineering, Textile Chemistry, Textile Engineering, and Textile Management.

**School of Home Economics**, includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Degrees: Bachelor of Science.

**School of Pharmacy**, includes the Departments of Pharmacy, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy, Pharmacy Administration, and offers a curriculum in *Pharmacy*.

Degree: Bachelor of Science in Pharmacy.

**School of Veterinary Medicine**, includes the Departments of Anatomy and Histology, Microbiology, Pathology and Parasitology, Physiology and Pharmacology, Large Animal Surgery and Medicine, and Small Animal Surgery and Medicine, and offers a curriculum in *Veterinary Medicine*.

Degree: Doctor of Veterinary Medicine.

**The Graduate School**, administers programs leading to the degrees of Master of Arts, Master of Science, Master of Agriculture, Master of Arts in College Teaching, Master of Fine Arts, Master of Building Construction, Master of Business, Master of Education, and Master of Home Economics. Beyond the Master's degree, programs are offered leading to the degrees of Specialist in Education, Doctor of Education, and Doctor of Philosophy. The Master of City and Regional Planning is the newest graduate degree.

**Reserve Officers Training Corps**, includes the Department of Air Force Aerospace Studies, the Department of Military Science, and the Department of Naval Science.

## *The Campus and Buildings*

Located on the Auburn campus are 58 major classroom, research, and service buildings. There are 24 women's dormitories; two men's dormitories, an athletic dormitory and 384 apartments for married students in the Caroline Draughton Village. The main campus consists of 1,871 acres, of which 420 are intensively maintained.

In addition, the Agricultural Experiment Station owns 16,814 acres of land at the 10 substations, five experiment fields, four forestry units, the plant breeding unit, the ornamental field station, and the main station at Auburn.

The Auburn Memorial Coliseum was completed and occupied early in 1969. The arena seats 13,000, and it has stage facilities for conversion to auditorium use. The coliseum also has an auxiliary gymnasium and a swimming pool. It is occupied and used jointly by the Athletic Department and the Physical Education Department.

Haley Center, a 10-story classroom and office building, was completed and occupied in the spring of 1969. Primary use of the Center is assigned the School of Arts and Sciences and the School of Education.

Through the Auburn University Development Program, a new organization enabling Auburn alumni and friends to support the University, funds for the construction of a Nuclear Science Center were made available. A \$1,400,000 Nuclear Science Center is now in use.

Direction of the Auburn University Development Program is under a 55-member board known as the Auburn University Development

Council. All gifts obtained through the Development Program are received by the Auburn University Foundation, a corporation created expressly for that purpose and administered by a seven-man board of directors.

## Experiment Station Properties

The Agricultural Experiment Station System of Auburn University owns 16,731 acres of land at the ten substations, four experiment fields, four forestry units, plant breeding unit, ornamental horticulture field station, foundation seed stocks farm, and the main station at Auburn. Locations and acreages of the above mentioned units are as follows:

<b>Main Station</b>	Auburn	Lee	4,453
<b>Substations:</b>			
Black Belt	Marion Junction	Dallas	1,116
Chilton Area Horticulture	Clanton	Chilton	161
Gulf Coast	Fairhope	Baldwin	800
Lower Coastal Plain	Camden	Wilcox	2,755
North Alabama Horticulture	Cullman	Cullman	160
Piedmont	Camp Hill	Tallapoosa	1,409
Sand Mountain	Crossville	DeKalb	536
Tennessee Valley	Belle Mina	Limestone	760
Upper Coastal Plain	Winfield	Marion and Fayette	735
Wiregrass	Headland	Henry	532
<b>Experiment Fields:</b>			
Brewton	Brewton	Escambia	80
Monroeville	Monroeville	Monroe	79
Prattville	Prattville	Autauga	80
Tuskegee	Tuskegee	Macon	237
<b>Plant Breeding Unit</b>	Tallasse	Elmore	664
<b>Ornamental Horticulture</b>			
Field Station	Spring Hill	Mobile	22
<b>Foundation Seed Stocks Farm</b>	Thorsby	Chilton	180

In addition to the above, there are 1,972 acres at the Forestry Units in Autauga, Barbour, Coosa, and Fayette Counties.

## Library Facilities

The Ralph Brown Draughon Library, opened in January, 1963, has a study capacity for 2,000 students and room for one million volumes. Spacious reading rooms are separated by glass walls, giving a panoramic view of each floor, with fluorescent lights, contemporary furniture, and open book stacks aiding the student in his study.

The Library also contains 98 closed carrels for the use of faculty members and graduate students engaged in library research, seven rooms

for listening to recordings and a projection room with 108 theatre seats where special educational films may be viewed. The building is completely air-conditioned and has public elevators for use of patrons.

On July 1, 1968, the Library contained 564,410 volumes and more than 500,000 publications of federal and state governments. Materials issued by the various branches of the federal government, the Atomic Energy Commission, and the National Aeronautics and Space Administration and others are received on depository account. The collections in microphotographic reproduction are being increased rapidly. Each floor or division has one or more special reading rooms for various microforms.

Agricultural and engineering experiment station bulletins and others are available. Quantities of books, dissertations, and documents are received on microfilm and microcards, as well as important newspapers and periodicals. More than 8,600 serials are being received currently; back files are available for a large portion of these titles.

A number of special collections are maintained by the Library. Some of these are the George Petrie Memorial Collection, presented by Miss Kate Lane; the Flagg Architecture Library, given by the Alabama Institute of Architects; the Hodson Collection on the History of Agriculture, presented by Mr. Edgar A. Hodson, Arkansas State Agronomist; the personal library of the late Mrs. B. B. Ross; an excellent sports collection, donated by Mr. C. W. (Bill) Streit; and many others. The Library also contains a collection of documents and publications in Alabama history and government.

Borrowing privileges are extended to the members of the administrative, research, instruction, and extension staffs of the University; to University alumni and to governmental departments and agencies located in Auburn. Loan privileges are also extended to all citizens of the State by inter-library loan requests through their local libraries; to all students in residence; and to members of the Auburn Research Foundation.

Books for reserve use by the various classes are located in the Reserve Book Department on the first level. There is also a large reserve reading room, a general reading room, the Special Collections Department, a projection room and a browsing room on this floor. Popular and contemporary books, magazines and newspapers are available here. Housed on the second floor are the Humanities Division, the bibliography area, the Technical Services area, the Circulation Division, and the Administrative Offices. The third floor is devoted entirely to the Social Sciences, and the fourth floor to science and technology.

Branch libraries on campus are the Architecture Library and the Pharmacy-Veterinary Library. Hours of service vary in the branch libraries.

The Department of Archives, located on the first floor, accumulates and makes available the University archives, manuscripts, letters, notebooks, articles, papers and other materials of or by the various staffs of the institution; also similar materials dealing with the State of Alabama and the South in general. The Department is not open all hours

the Library is open; patrons and visitors may call the Department for information.

## *Sources of Revenue*

Auburn University derives its support from the State and Federal Governments and from other sources. Funds are as follows:

1. Direct annual appropriations made by the State for support, maintenance, and development of public education, including campus instruction, agricultural research, agricultural extension, engineering research, and educational television.
2. Special appropriations made by the State for buildings, purchase of lands, and improvements.
3. Funds derived from the original endowment of the institution under the Federal Land-Grant Act and earnings from other subsequently acquired endowment funds.
4. Income derived from the payment by students of fees and other charges. All tuition at Auburn University is free, except to non-residents of Alabama, but certain fees are assessed to cover specific services.
5. The Morrill fund appropriated by the United States Government for the instruction of students in the sciences relating to agriculture and the mechanic arts and in the English language, literature, and for the training of teachers in agriculture and the mechanic arts.
6. Funds received from the State of Alabama through the Smith-Hughes Act derived from the congressional appropriation and paid to Auburn University for its work in the training of teachers of agriculture and home economics.
7. Such revolving funds as may be incident to the operation of any department where it is advisable to sell or dispose of products produced in the course of conducting the Agricultural Experiment Station or any other unit of the institution.
8. Gifts, grants, and donations received from alumni, private individuals, and organizations both for general and restricted educational purposes, including scholarships.
9. Direct annual appropriations made by the United States Government for research purposes and devoted to investigation of scientific agricultural problems. These funds are also for research purposes in connection with investigation of new experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products, and research work regarding Home Economics, and for the purpose of publishing these results.
10. Direct appropriations made by the United States Government for the Cooperative Extension Service in support of County Agricultural and Extension Home Agents, for the support of boys' and girls' 4-H club work, and for other types of extension

work in agriculture and home economics in the several counties of Alabama.

11. Each county in the State makes certain appropriations to supplement those from the United States Government and the State of Alabama for the support of the Cooperative Extension Service.
12. Funds received from industry, governmental agencies, and private individuals for special contractual research projects which are handled through the Office of Contract and Grant Development by organized research units and/or in appropriate academic schools.

# For Prospective Students

## *Admissions*

### **General Admissions Information**

#### ***Application Instructions***

Application for admission to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Auburn, Alabama 36830. The necessary application forms and specific instructions may be obtained from the Admissions Office.

Students may apply for admission to any quarter of a given calendar year as early as October 1 of the preceding year. Because of the large number of applications, credentials should be filed at the earliest possible time. In every case, complete admission credentials, including the physical examination report, must be filed at least three weeks prior to the opening of the quarter in which admission is desired. The University reserves the right, however, to establish earlier deadlines should the number of applicants exceed the number of students who can be adequately housed or instructed.

A ten dollar (\$10.00) application processing fee must accompany all applications for admission. This fee is required for all undergraduate applications and is not refundable or applicable to registration or tuition fees. In submitting admission credentials, applicants must give complete and accurate information. False or misleading statements can result in denial of admission or cancellation of registration.

A provisional notice of acceptance may be issued after submission of only the application form and up-to-date academic documents, but each applicant must complete and return, at least three weeks prior to the opening date of the quarter in which admission is desired, a medical examination report on a form which will be furnished by the University. The University reserves the right to require any student to submit to such additional medical examinations as are believed advisable for the protection of the University community, and to refuse admission to any applicant whose health record indicates a condition which college work would affect adversely or which would be harmful to the students of the University. Any applicant who fails to comply with this requirement will not be admitted to the University.

Applicants may be admitted to most undergraduate curricula in any quarter; however, to Veterinary Medicine, they may be admitted in the Fall Quarter only. For additional information about admission to Veterinary Medicine, see page 165.

#### ***Non-Resident Students***

Preference is given to the admission of residents of Alabama; however, applications from out-of-state residents will be accepted. The num-



ber of out-of-state students who are accepted will be determined by the availability of facilities and faculty.

In assessing fees, students are classified as resident and non-resident students. Non-resident students (except Graduate students and son and daughters of ministers) are required to pay a tuition fee. The term "resident" as used in this policy is interpreted to mean the state in which the parents are domiciled. Guardian is interpreted to mean a bona-fide guardian appointed in a judicial decision by a court of law.

A resident, if under 21 years of age, is one whose parents or guardian have been residents of Alabama for at least 12 consecutive months preceding the original enrollment or whose parents were residents of Alabama at the time of their deaths and who has not acquired residence in another state. In all cases of guardianship, the period of guardianship must have been not less than 12 months at the time of original enrollment. If the parents are divorced, residence will be determined by the residency of the parent to whom the court has granted custody.

A resident student, if over 21 years of age, is one whose parents are or were at the time of their deaths residents of Alabama and who has not acquired residency in another state; or who, as an adult, has been a resident of Alabama for at least 12 consecutive months preceding the original enrollment; or who is the wife of a man who has been a resident of Alabama for at least 12 consecutive months preceding the original enrollment.

Alabama laws provide that residency may not be acquired by attendance at an institution of higher learning. Students whose residency follows that of parents or guardian shall be considered to have gained or lost residency in Alabama while in college according to changes of residence of parents or guardian. For fee purposes, residence shall not be considered to have been gained until 12 months after such persons have become residents of Alabama. A dependent of a member of the Armed Forces stationed in Alabama on active duty by official orders shall not be liable for payment of non-resident tuition during the period of military assignment in Alabama.

Any question concerning residency should be directed to the Registrar. The burden of proof of residency is upon the student. A non-resident student who registers improperly under the above regulations will be required to pay not only the non-resident fee, but also a penalty fee.

### ***Pre-College Counseling Program***

As a means of helping entering freshmen and transfer students to make wiser decisions in choosing their field of study and to adjust more readily to their first quarter of college life, Auburn University has instituted the Pre-College Counseling Program.

**Summer program for fall quarter freshmen** — The summer program for freshmen entering the fall quarter consists of a series of sessions on campus. During these sessions students talk with trained counselors and are given the opportunity to plan, with advisors, a schedule for their first quarter of college work.

**Program for freshmen entering winter, spring, or summer quarters** — Students entering Auburn University as first quarter freshmen for any quarter, other than the fall quarter, are usually required to report to campus one day earlier for counseling activities.

**Program for transfer students** — Transfer students entering the winter, spring, or summer quarters are usually required to report to campus one day earlier than other students. Transfer students entering the fall quarter are given the opportunity to attend a program in the latter part of the summer to meet with advisors in order to have their transcripts evaluated and plan a schedule for the fall quarter.

## Admission To Freshman Class

### *Standard Admission*

Commensurate with available faculty and facilities, favorable consideration for admission will be given to graduates of accredited secondary schools whose college ability test scores and high school grades indicate they can be successful in fields of study in which they seek enrollment.

Although the University makes few stipulations about definite high school courses, all students planning to apply for admission should emphasize in their programs the following subjects: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Students applying for admission to the professional curricula in architecture, industrial design and interior design will be required to make a satisfactory score on the architectural school aptitude test. Application for this test must be made to the Educational Testing Service, P.O. Box 592, Princeton, N. J. 98540. Tests are given on certain dates at the Auburn campus as well as at other university and college campuses throughout the United States.

Alabama residents are required to complete the American College Test (ACT) on one of the announced national testing dates. Either the ACT or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be accepted for applicants from states other than Alabama. High school students may secure application forms and information regarding the tests from their principals or counselors. Scores attained on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding university-administered scholarships and loans.

At least one unit of college preparatory mathematics (geometry or algebra) is required for admission to any curriculum. Curricula which list the course MH 159 or the course MH 160 presuppose a competence in the mathematics commonly taught in high school geometry and second-year algebra; and curricula which list MH 161 as a first course in mathematics presuppose, in addition, competence in high school "analysis" (specifically, the function concept, graphs of functions, the trigonometric functions). A deficiency in this latter material can be made

up by taking the course MH 160 at Auburn. Auburn University offers no course comparable to high school geometry or to first and second year high school algebra.

Applicants of mature age who have not graduated from high school may be considered for freshman admission if scores made on the USAFI General Educational Development Test, the American College Test and/or such special achievement tests or subject examinations as may be recommended by the Committee on Admissions, indicate educational attainment equivalent to graduation from high school. Applicants from non-accredited high schools may be accepted if they make satisfactory scores on tests prescribed by the Committee on Admissions.

### ***Early Admission***

Students of high academic promise may be admitted directly from the eleventh year of school without the secondary school diploma. Basic requirements for early admission are:

1. Proper personal qualifications.
2. Superior competence and preparation as evidenced by the high school record, and by satisfactory scores on pre-admission aptitude tests, College Entrance Examination Board achievement tests in English, mathematics, and history or a science, pre-registration placement tests, or proficiency tests administered by appropriate departments at Auburn University.
3. A letter from the principal recommending the applicant as to emotional and social maturity and readiness for college work, and indicating approval of his early admission.

Details of procedure for consideration of early admission can be obtained from the Admissions Office.

### ***Advanced Standing Program***

Under the Advanced Standing Program, able students of superior preparation are afforded the opportunity of being placed in programs suited to their abilities and preparation for college study. Some exceptionally able students may be admitted prior to high school graduation. (See "Early Admission.") High school graduates of superior achievement may be able to qualify for advanced placement and for credit which may count toward degree requirements.

**Advanced Placement** — Entering freshmen who demonstrate superior preparation are accorded the opportunity of qualifying for advanced placement and/or credit, not to exceed a total of 45 quarter hours, in the following areas: Biology, Botany, Chemistry, English, Foreign Language, History, Mathematics, Physics, and Zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations.

A student with special competence in a specific area, as evidenced by high school grades and scores on college ability or

achievement tests, may apply for a departmental examination which may qualify him for advanced placement or credit in that department.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned. A brochure describing the Advanced Standing Program will be forwarded by the Office of High School Relations upon request.

**Proficiency Examinations** — Proficiency Examinations similar to final examinations may be administered by a department upon application of the individual student. A student who has pursued college-level work in secondary school, in class or on a tutorial basis, or through private study, may make application for a proficiency examination. If he earns a satisfactory grade, he will be eligible for placement in an advanced course and for credit in the subject covered by the examination.

## Admission Of Transfer Students

An applicant who was not eligible for admission to the University upon graduation from high school must present a minimum of 96 quarter hours or 64 semester hours of college work attempted in order to be considered for admission as a transfer student.

For residents of Alabama or other states party to the Southern Regional Education Board, a satisfactory citizenship record, an overall average of "C" or better on all college work attempted,\* and eligibility to re-enter the last institution attended are required for transfer admission. For residents of other states, in addition to the other two stipulations, an overall "B" average on all college work attempted is required. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

Graduation from a junior college does not of itself assure an applicant of admission to Auburn. Such applicants must also present an overall average of "C" or better on all work attempted. The maximum credit allowed for work done in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Each applicant must submit two official transcripts of his record from each institution attended. It may also be necessary for a transfer applicant to submit one transcript of his high school record.

The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the Registrar. Acceptance of "D" grades is determined by the dean, except that credit is allowed in Freshman English only on grades of "C" or better. See page 51.

Students transferring from institutions not fully accredited by the appropriate regional agency will be granted provisional credit. Final credit will be assigned after the student has completed one full year of work (credit hours and residence quarters) at Auburn University.

\*When computing the overall grade average, Auburn University uses the 3.0 system and counts all grades earned, including those earned in courses which were later repeated.

If a "C" average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which a "C" average was not made.

## **Admission Of Transient Students**

A student in good standing in an accredited college or university may be admitted to Auburn University as a transient student when available faculty and facilities permit.

To be eligible for consideration for admission, a transient student applicant must submit a satisfactory medical report and the Transient Student Form (in duplicate) properly completed and signed by the Dean or Registrar of the college or university in which he is currently enrolled.

Permission to enroll in courses on a transient basis is granted for one quarter only, and a student who wishes to seek re-entry in the transient classification must submit another Transient Student Form. It must be understood that transient student permission does not constitute admission or formal matriculation as a regularly enrolled student (degree candidate); however, a transient student is subject to the same fees and regulations as a regular student, except that ROTC, physical education, and academic continuation in residence requirements shall not apply.

It is the responsibility of the transient student to check with the academic department offering the courses in which the student wishes to enroll to determine if he has met course prerequisites and if he has the necessary preparation to take the courses desired.

If at any time a transient student desires to enroll as a regular student, he must make formal application for admission to the University as a transfer student and submit two complete transcripts from each college or university attended.

## **Admission Of Unclassified Students**

For residents of Alabama and other states party to the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of a baccalaureate degree from an accredited senior college or university. For residents of other states, Unclassified Student admission may be granted on the basis of the baccalaureate degree and an overall "B" average. Students desiring to enroll in this classification must submit the same admission credentials as transfer applicants.

## **Admission Of Special Students**

Persons who cannot fulfill the regular admission requirements for freshman standing but otherwise have acquired adequate preparation for university courses may be admitted as special students on approval of the Committee on Admissions and the dean concerned. Course credits earned by special students generally cannot be used as credit toward a degree at Auburn University.

## Admission Of Auditors

When available faculty and facilities permit, a person not desiring admission for course credit may be allowed to audit a lecture course or the lecture part of a combined lecture and laboratory course with the approval of the Admissions Office, the student's dean, and the head of the department in which the course is offered. A formal application for admission must be filed, but the \$10.00 application processing fee and the physical examination report are not required. (See Auditing Privilege, page 50.)

## Admission To Graduate Standing

Admission to graduate standing is granted only by the Graduate School of the University. Graduation with a Bachelor's degree or its equivalent from an accredited college or university plus submission of satisfactory scores on the Aptitude Test of the Graduate Record Examinations are requisite for admission to the Graduate School. The undergraduate preparation of each applicant for admission must also satisfy the requirements of a screening committee of the school or department in which he desires to major. Any student in good standing in any recognized graduate school who wishes to enroll in the summer session, in an off-campus workshop or in a short session and who plans to return to his former college may be admitted as a "graduate transient." For further information see section on The Graduate School and contact the Graduate School for a special catalog.

## Re-admission of Former Students

Students who have attended Auburn University and desire to re-enter must secure a registration permit from the Registrar's Office. Students who have attended another institution for one (1) quarter or semester must be eligible to re-enter the institution attended. Students attending another institution for more than one (1) quarter or semester must also have earned at other institutions attended an overall average of "C" or better to be eligible to re-enter Auburn University. Two (2) transcripts must be furnished the Registrar's Office from the institution attended.

## Living Accommodations

The operational plan for University dormitories is predicated on the belief that a university education is not limited to classroom activities. A true university education includes the total experience of living within an educational environment. A schedule of activities, student government, and a diversified program which the residents help plan and in which they participate are important parts of university education.

In all University dormitories and apartments, careful precautionary measures are taken to assure the security of the residents and their personal property. However, the University does not insure personal



property of the residents and is not responsible for damage to or loss of personal property of occupants of University-owned facilities.

The University reserves the right to inspect periodically the rooms of students living in University housing.

## Men Students

Auburn University provides dormitory accommodations for approximately 1,100 men students. The men's dormitories are in two areas, Magnolia Dormitories and Roy Sewell Dormitory.

Magnolia Dormitories, housing 931 men students, is a two-building unit in the northwestern part of the campus. All units are of brick, hollow tile, and steel construction and together form one of the best-equipped resident areas for college men in the South. Magnolia Hall and Bullard Hall are connected to form a harmonious architectural and living pattern. Both buildings are arranged into divisions of approximately 40 students. These divisions, wherein residents share the experiences of living and working together, form the nucleus of the dormitory program. There is a resident adviser for each division. The resident advisers are assisted by senior advisers, under the direction of the director, in carrying out the dormitory program.

In the Magnolia Dormitories two students share a room. Each student has his own single bed, closet, and study table. The dormitories contain a dining hall, well-appointed lounge and recreational areas, a post-office, a snack shop, and other facilities to make a complete living unit. The housemothers, the senior advisers, and the director have their apartments in the buildings.

Roy Sewell Dormitory, which houses 144 men students, is equipped with dining facilities and is supervised by a resident staff member. There are two boys in each of the 72 rooms, with separate study hall and lounge.

**Room Reservations** — In order to provide housing for its students at the lowest rate possible, Auburn University must operate Magnolia Dormitories on the basis of a contract for the academic year and/or the Summer Quarter. The academic year consists of the Fall, Winter, and Spring quarters; or, that portion of this period following the quarter for which a student is accepted by Magnolia Dormitories. The Summer Quarter is regarded as a separate contract period.

It is not necessary for men applying for undergraduate University admission to make separate requests for University housing. Applications For Residence and Housing Agreements are mailed with tentative acceptance forms by the University Admissions Office. If housing applications for that school quarter are in excess of capacity, notice will be given promptly. Inquiries from former Auburn University students and graduate students should be addressed to Magnolia Dormitories. The completed Application, with a \$25.00 check payable to Auburn University for room reservation deposit, should be returned to the Director, Magnolia Dormitories, as soon as possible. Room deposits are held to cover possible loss and/or damage to dormitory property and are not applicable to payments of room rents. The completed Housing



Agreement, with prepaid rent for at least one quarter, must reach the Dormitories office not later than the applicable deadline.

Refunds of room deposit and prepaid rent will be made under the following conditions:

1. When reservations for the Fall Quarter are cancelled on or before July 1, prior to the beginning of the Fall Quarter.
2. When Winter Quarter reservations, which would be the FIRST quarter of residence, are cancelled on or before December 1.
3. When Spring Quarter reservations, which would be the FIRST quarter of residence, are cancelled on or before March 1.
4. When reservations for the Summer Quarter are cancelled on or before May 15.
5. When room is vacated at the end of a contract period and no future reservations are desired.
6. When a student is prevented from returning because of scholastic deficiencies.
7. When a resident is drafted into military service during a contract period.
8. When personal illness, or physical injury, necessitates withdrawal during a contract period.
9. When a student graduates from the University, or terminates his Housing Agreement in order to participate in one of the University's short term programs (Co-op, Vet. intern, practice teaching).
10. When a student withdraws from the University at the end of a school quarter.

Conditions governing refunds of room deposits and prepaid rent in certain other circumstances are detailed in the Magnolia Dormitories Housing Agreement. Note that a student who has signed an Agreement and who enrolls that quarter will be held responsible for fulfilling his Agreement. A student who has signed an Agreement and who does not enroll will be charged full rental for that quarter but will receive a refund of his room deposit. A student who has applied for housing, has not cancelled before the applicable deadline, but has not signed an Agreement will forfeit his room deposit regardless of whether he enrolls.

**Room and Board Charges** — Room rent for aid-conditioned rooms in Magnolia Dormitories is \$80.00 per school quarter. Rent for rooms not air-conditioned is \$60.00 per quarter. When available, private rooms are 50 percent additional. Residents of Magnolia Dormitories may elect to take meals in Magnolia Dining Hall, or elsewhere. The charge for meals, seven days a week, in the Dining Hall is \$160.00 per school quarter. The charge for meals, five days a week, is \$135.00 per quarter. All board charges are subject to payment of applicable sales tax. Although every effort will be made to maintain the present room and board rates, it may be necessary to increase these charges if related costs advance abnormally.

Room rent for the first quarter of residence in Magnolia Dormitories is payable in advance to that Office not later than: Fall Quarter — July 1; Winter Quarter — December 1; Spring Quarter — March 1;

Summer Quarter — May 15. Payment may be made for one quarter, or for the full academic year. Rent due, following the first quarter of residence, is payable at the beginning of each quarter. Board accounts for students electing to take meals in Magnolia Dormitories are also due and payable in full at the beginning of each quarter. However, when deemed necessary, arrangements may be made with the Cashier in the Magnolia Dormitories Office for payment in not more than three installments.

Students who, at the beginning of a quarter, elect to have meals in Magnolia Dining Hall may withdraw from such arrangements within the first two weeks of the quarter. In these instances, there is a minimum charge for the two weeks plus a \$7.50 cancellation charge. No change in board arrangements may be made by dormitory residents after this period has elapsed. Students withdrawing from school after two weeks will be charged on a daily basis plus the \$7.50 cancellation charge.

**Off-Campus Housing.** The majority of the male students reside in fraternity houses and in privately-owned housing within the community. These accommodations include dormitories, boarding houses, homes, trailers, and apartments. Charges for rooms without meals range from \$50.00 to \$130.00 for each school quarter. Prices for meals in the various boarding houses range from \$55.00 to \$65.00 per month.

University representatives neither inspect nor approve off-campus housing. The only requirement is that the accommodations conform to the local code of health and safety regulations. However, the same general rules of student conduct apply in off-campus residences as are applicable in University operated dormitories. It is justifiably assumed that the conduct of each student living off-campus will reflect maturity of judgment and a feeling of pride in being a member of the Auburn community.

Thorough familiarity with the terms of the rental agreement and personal contact with the owner, or agent, will help avoid future misunderstandings. The quality of accommodations and the distance from the campus can best be determined through actual inspection before renting. A current file of available off-campus accommodations is maintained in the Office of Student Affairs, 304 Martin Hall. Lists of off-campus room vacancies are available upon request during the two months preceding the Fall Quarter.

## **Women Students**

Housing for approximately 2,800 women is furnished in the women's dormitories. Residence in the dormitories is compulsory for all women students unless the Dean of Women gives them special permission to live elsewhere. A head resident is in charge of each dormitory and serves as counselor to the students as well as dormitory hostess. Women students are subject at all times to regulations of the University and the Associated Women Students.

All students residing in the dormitories must eat in the University dining halls where meals are served under the supervision of trained dietitians. Costs for special diets will be borne by the student.

The women's dormitories consist of the main dormitory group and the South Women's Dormitories.

In the main dormitory groups are the following:

No.	Name	No.	Name
I	Elizabeth Harper Hall	VIII	Ella Lupton Hall
II	Kate Conway Broun Hall	IX	Helen Keller Hall
III	Willie Little Hall	X	Marie Bankhead Owen Hall
IV	Kate Teague Hall	XII	Dana King Gatchell Hall
V	Letitia Dowdell Hall		Alumni Hall
VI	Allie Glenn Hall		Auburn Hall
VII	Mary Lane Hall		Noble Hall

Harper, Broun, Little, and Teague Halls, Social Center and the Women's Dining Hall form a quadrangle in the foreground of the dormitory area located across from the Auburn Union. The Dining Hall is readily accessible to all the dormitories in the area. Each of the dormitories, I through X, houses approximately 100 girls and is arranged in suites consisting of two double rooms connected by a tiled bathroom. The rooms are equipped with twin beds, a double desk, two desk chairs, a reading lamp, a bedside table, an easy chair and two chests. Lounge space is furnished in each building. Dormitories I through IV and VII are air-conditioned.

Dana Gatchell Hall, located on Mell Street, adjacent to the other dormitories, houses approximately 50 girls. It has community baths located at the end of the hallways and is furnished in a manner similar to the other dormitories. Gatchell Hall is a cooperative dormitory. Here the girls prepare their own meals and do their own cleaning; as a result, cost of room and board is much less than in the other dormitories.

Alumni Hall, located on South College Street, houses approximately 100 girls. This dormitory has its own dining hall located in the basement of the building. The rooms are not in suites, there are community baths, and the furnishings are the same as in the other dormitories.

Auburn Hall, on East Thach Avenue, houses 182 girls. Community baths are located conveniently on each floor. The girls living here take their meals in Alumni Dining Hall, approximately two blocks away.

Noble Hall is located on West Magnolia, next to Magnolia Dormitory for men. It houses 170 girls and was newly decorated and furnished throughout in the fall of 1968. The rooms are not in suites and there are community baths on each floor. Girls living here take their meals in Magnolia Dining Hall.

The offices of the Dean of Women, the Assistant Dean of Women, the Assistant to the Dean of Women, the Dormitory Supervisor, and cashier's office, are located in Social Center. In addition, there are two large living rooms, a dining room, and a kitchen which may be used by student groups. The post office for the girls in this area is located on the ground floor of the Women's Dining Hall.

The South Women's Dormitories are located in the area in front of the President's home. Ten new air-conditioned dormitories, a dining hall, and an administration building are in the group.

The dormitories are:

A Mollie Hollifield Hall	F Dixie Bibb Graves Hall
B Annie Smith Duncan Hall	G Camille Early Dowell Hall
C Marguerite Toomer Hall	H Stella White Knapp Hall
D Zoe Dobbs Hall	J Mary Boyd Hall
E Berta Dunn Hall	K Sarah Sasnett Hall

Each of the three-story dormitories houses 110 girls and the six-story dormitories, Sasnett and Boyd, house 216 girls. The rooms are arranged in suites with a connecting bath between each two double rooms. Each room is furnished with twin beds, a bedside table, two desks and desk chairs, a double dresser and an easy chair. A formal lounge and an informal lounge are in each dormitory, with study rooms on each floor.

The administration building, Lucille Burton Hall, is similar to Social Center and houses the office of the Head of Women's Housing, an Assistant to the Dean of Women, and the Assistant to the Dormitory Supervisor, the cashier's office and the post office for this area. There are several attractive lounges in the building and a number of guest rooms are on the second floor.

All students provide their own bed linens and any other items they may wish to use to make their rooms more attractive.

Room rent per school quarter is \$80 in Auburn and Alumni Halls, \$90 in the non-air-conditioned dormitories, and \$110 in the air-conditioned dormitories. This includes the cost of private phones which are located in each room. If a student moves into a room at the first of the quarter and then withdraws from the dormitory, she is charged a minimum of  $\frac{1}{3}$  of the room rent for the quarter.

All women students are required to take meals in the dormitory dining halls. There are two meal plans available. The cost of the seven days per week plan is \$150 plus sales tax. The cost of the five days per week plan is \$125 plus sales tax. The room and board charges will be collected when the student arrives on the campus.

**Room Reservations** — Dormitory reservation forms will be mailed to the applicant at the time she is accepted for admission to the University. This form must be returned to the Head of Women's Housing with a deposit of \$25.00 within three weeks of the date of acceptance. No room reservation is binding until this fee has been received.

*Refund of room reservation fees will be made under the following conditions:*

1. When reservations for the fall quarter are cancelled on or before August 1.
2. When the reservations for the winter quarter are cancelled on or before December 15.
3. When reservations for the spring quarter are cancelled on or before March 1.

4. When reservations for the summer quarter are cancelled on or before May 15.
5. When room is vacated at the end of a quarter and no further reservation is desired, if notice has been given by the deadline stated above.
6. When a student is prevented from entering because of scholastic deficiencies.
7. When personal illness or physical injury necessitates cancellation of reservations.

A room reservation is not valid unless the applicant has been admitted to Auburn University.

## Married Students

Auburn University operates the Caroline Draughton Village housing project for married students. The project has 384 apartments. Of these, there are 144 two-bedroom air-conditioned, 80 two-bedroom non-air-conditioned, and 160 one-bedroom non-air-conditioned apartments.

The apartments are furnished including an all electric kitchen, completely furnished living room and one bedroom, spacious closets, ample cabinets, all tile baths with shower-tub combination, interspring mattresses, steam heat, and television outlet.

Deposits are accepted for housing in Caroline Draughton Village from prospective male married students, who have been accepted for admission. For additional information, write: Frank Reeves, Housing Manager, 901 W. Thach Avenue, Auburn, Alabama 36830.

**Off-Campus Housing** — In addition to the University-operated apartment projects, housing may also be obtained in apartments, houses, and trailers in the Auburn community. Rent for these facilities is competitive with University-operated housing. The same general rules of conduct applicable in University-operated apartments and the same referral services of the Student Affairs Office, 304 Martin Hall, as indicated on page 27, apply for married students living off-campus.

## Fees and Charges

Auburn University's fees have remained somewhat lower than fees charged at similar institutions in the Southeast and throughout the Nation as a whole. As costs have risen small increases in fees charged have been authorized by the Board of Trustees from time to time to meet these increased costs. Every effort is made to hold these charges to the minimum.

**Payment of fees and charges** — Students are expected to meet all financial obligations when they fall due. Auburn University reserves the right to deny admission to or to drop any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to keep informed of all registration and fee payment dates, deadlines and other requirements by referring to the official university calendar of events in the catalog, announcements printed in the Plains-

man or disseminated through other media from time to time. Where necessary, students should inform their parents of the deadline dates and the necessity for meeting them.

**Checks** — Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will be assessed the late penalty of \$5.00 or \$10.00, whichever is applicable, and if payment is not cleared promptly the student's registration will be cancelled.

**Veterans** — Veterans enrolled under the Federal G.I. Bill P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students (This does not apply to P.L. 894 or P.L. 815).

## Basic Quarterly Charges

Students should be prepared to complete Registration by payment of these fees upon notice two weeks to three weeks before the beginning of the quarter.

Any student taking 10 or more credit hours or who is certified by the School of Graduate Studies as a full-time student will pay full fees.

### University and Student Activity Fee (All Curricula) \$120.00

The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

Student Activities Fee supports such activities on campus as intercollegiate athletics, band, debating, dramatic arts, entertainment, exhibits, Glomerata, intramural sports, music, Plainsman, lectures and concerts, religious life, social affairs, student government, student union activities and operations, and Tiger Cub. This fee includes 25¢ held in reserve to cover unnecessary damage to University property by students.

### Non-Resident Fee \$120.00

Additional fee charged all non-resident full-time students other than graduate students and dependent sons and daughters of ministers. (See catalog section relating to residency requirements.)

### Part-time Students (not exceeding 9 hours per quarter.)

Registration fee 17.50

Additional fee per credit hour 10.00

No additional charge is made beyond 10 hours and students who register for two six-week terms will pay a maximum of \$120.00 as residents or \$240.00 as non-residents where 10 or more hours are carried. The \$17.50 registration fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty



and staff are eligible to participate in Student Health Services and Student Activities.

### **Clearing for Graduation Fee** 17.50

A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a pre-requisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.00.) Graduation fee is to be paid in addition to this charge.

## **Other Fees And Charges**

### **Service and Penalty Charges for Late Registration or Payment** \$5.00-\$10.00

All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges:

Up to and including final official Schedule Adjustment period 5.00

After Schedule Adjustment period closes 10.00

### **Auditing Fee (per course)** 10.00

Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)

### **Change in Course Fee** 5.00

Charge is made in cases where student is not required or advised by the University to change, but has the Dean's permission to do so after classes begin.

### **Change in Curriculum Fee (if change made after classes begin)** 5.00

### **Correspondence Study Course Fees (each credit hour)** 10.00

### **Doctoral Dissertation Microfilming Fee** 25.00

### **Duplicate Diploma Fee** 5.00

### **Equivalency Examination Fee (GED) (each)** 7.50

### **Field Laboratory Program — Off Campus Courses**

Registration Fee 5.00

Additional Fee per credit hour 10.00

### **Graduate Thesis and Dissertation Binding Fee (per copy)** 4.50

Three to five copies usually required.

### **Graduation Fee** 10.00

Payable at beginning of the quarter in which the student expects to receive a degree

### **Music Fees**

Applied Music per quarter — one ½ hour lesson per week 20.00

Applied Music — two ½ hour lessons per week 30.00

Applied Fundamentals of Music — per quarter  
(Class instruction in piano or violin) 5.00



Practice Fee — per quarter — one hour per day	3.00
two hours per day	5.00
Instrumental Rental Fee — per quarter	3.00

**Physical Education Fee**

2.50

For each quarter a student is enrolled in a one-hour activity course.

**Nursery School and Kindergarten**

Nursery School Group, 9 a.m. to 12 noon (per quarter)	32.00
Nursery School Group, 9 a.m. to 12:45 p.m. (per quarter)	47.00
Kindergarten Group, 1 p.m. to 4 p.m. (per quarter)	32.00
Children of multiple birth: full fee for first child; \$10.00 per quarter for each additional child.	

These fees must be paid before the child is admitted. For application information, contact Head of Dept. of Family and Child Development.

**Retail Training HE335 or****Journalism Internship JM425**

Fees will be one-half the regular Full-time University Fee and one-half Non-Resident Fee if applicable.

**Room and Board (Women) \$195.00 to \$260.00**

All women students, except those granted special permission by the Dean of Women, or those enrolled in the School of Graduate Studies, are required to live in dormitories and take their meals at the Women's Dining Halls. (Add sales tax for meals.)

**Room and Board (Men) \$195.00 to \$240.00**

Residents in the dormitories for men may elect to take their meals in the dormitory dining halls, or elsewhere. Men students may also live off-campus. For further information see page 26. (Add sales tax for meals.)

**ROTC Uniform and Equipment Deposit (refundable) 30.00**

All students, both Basic and Advanced, are required to deposit the sum of \$30.00 with the Bursar of the University, prior to enrollment in ROTC, except Naval ROTC. They are then furnished a uniform in good condition and other necessary supplies through the ROTC Supply Office. Upon completion of the ROTC course of instruction, or upon withdrawal of the student therefrom, the uniform and other supplies are turned in and the deposit returned to the student, less \$1.50 per quarter withheld by the Bursar of the University to cover the cost of cleaning and repair of uniforms, when applicable and to support ROTC activities as follows: scholarship and marksmanship awards; special apparel and equipment for competitive drill teams, ROTC honoraries, and rifle teams representing Auburn University ROTC; uniforms for sponsors; the official annual Military Ball in an amount not to exceed \$.40 per cadet enrolled that quarter. This charge

is subject to change in accordance with requirements of the Army, Navy, and Air Force training programs.

### Service and Penalty Charges

(a.) Registration fees billed home	2.00
(b.) Charge for returned checks (each)	2.00
(c.) Failure to pay fees due or make returned check good on notice, where two or more notices required	5.00 or 10.00
<b>Notice — CHECKS ARE ACCEPTED SUBJECT TO COLLECTION</b>	

### Special Examination Fee

If taken at a regularly scheduled period	2.00
If taken out of regularly scheduled period	5.00

### Special Services Fees

Cooperative Education Program	15.00
Internship Fee — Veterinary Medicine	15.00
Postdoctoral Fellow; One-time enrollment	15.00

### Transcript Fee

1.00

### Registration Fee Cancellations or Refunds

If student pays fees prior to opening of the quarter, then withdraws prior to registration date for new students, all fees will be refunded. If student resigns within the first two weeks after classes begin, all fees, less charges, will be refunded, except the sum of \$10.00 will be retained as a registration fee, and if the student has used the University Health Services, during that quarter, the \$7.00 Health Fee will be retained also. No refunds will be made in case of withdrawal after two weeks of classes, except in cases of withdrawal caused by personal illness or call into military service. (For Summer Quarter — Term II — No refunds will be made in case of withdrawal after the first week of Term II.) Students suspended for disciplinary reasons are not eligible for refunds nor cancellation of accounts due.

**See *Montgomery Center Bulletin* for fees and charges at the Montgomery Center.**

## Financial Aid

Auburn University has an **Office of Student Financial Aid** to provide financial assistance to aid worthy students in meeting educational costs incurred while attending the University.

The University participates in the College Scholarship Service (CSS) of the College Entrance Examination Board. Participants in CSS subscribe to the principle that the amount of financial aid granted a student should be based upon financial need. The CSS assists colleges and universities and other agencies in determining the student's need for financial assistance. Entering students seeking financial assistance are

required to submit a copy of the Parents Confidential Statement (PCS) form to the College Scholarship Service, designating Auburn University as one of the recipients, by March 1 of each year.

A pamphlet describing financial aid programs and procedure for making application may be obtained by writing to the Office of Student Financial Aid, Auburn University.

## **Available Assistance Programs**

**Scholarships** — Awards made to students with financial need who have demonstrated high academic promise and attainment.

**Federal Educational Opportunity Grants** — Limited number of grants for students with exceptional financial need.

**National Defense Student Loan and Institutional Loans** — Long term loan programs for students who can demonstrate need.

**Federal-State Student Guaranteed Loans** — Long term loan program whereby students may borrow from lending institutions (banks, credit unions, etc.)

**College Work-Study Program** — Program of employment for college students coming from low income families, who need to work to remain in school.

**Student Employment** — Many students are able to find part time employment on and off campus. A student may file an application with the Office of Student Financial Aid and vacancies are filled as they occur. The office acts as a referral agency and cannot promise jobs to students. Student wives may secure assistance in locating employment by contacting the University Personnel Office.

**Graduate Aid** — To promote scholarship and research among graduate students, a number of Graduate Teaching Assistantships, Graduate Research Assistantships, Graduate Fellowships and Traineeships are available. Contact the Head of Department of major interest for information and application.

## **Benefits For Veterans And Dependents Of Veterans**

**Federal** — Consult local County Veterans Service Officer or Veterans Administration Office, Montgomery, Alabama 36102.

**State** — Consult the Department of Veterans Affairs, P.O. Box 1509, Montgomery, Alabama 36102.

**Social Security** — Consult the local or county Social Security Office.

**Vocational Rehabilitation** — Consult the State Rehabilitation Office, Room 461, State Office Building, Montgomery, Alabama 36102.

## **Employment**

The Student Financial Aid Office in 202 Martin Hall assists students in obtaining employment to defray a portion of their educational expenses. The University, however, does not advise freshmen to attempt work during their first quarter on campus unless it is essential. Earnings vary with the job requirements and previous work experience.

Since employers must know when a student is free for work, little assistance can be given any student until his class schedule is known.

The Office functions only as a referral agency and cannot promise jobs to students; however, every attempt is made to place capable students needing work.

Students are also assisted in locating full-time summer employment at resorts, national parks, camps, with governmental agencies and in business and industry. Information and applications for such employment should be secured early in the Winter Quarter.

Student wives and other non-students may secure assistance in locating suitable employment on the campus by contacting the University Personnel Office which is located on the ground floor of Langdon Hall.

## **Educational Benefits For Veterans**

Many current publications describe in complete detail the educational programs authorized by Congress under the following federal acts: Public Law 16 (Vocational Rehabilitation), Public Laws 894 and 815 (Vocational Rehabilitation Revised), Public Law 634 (War Orphans Educational Assistance Act) and Public Law 358 (Veterans Readjustment Benefits Act of 1966).

Auburn University is fully approved by the Veterans Administration to give training under these laws. Veterans planning to attend school under one of these laws should make application directly to the Veterans Administration and get prior approval before entering school.

Those entering school under the benefits of any one of the laws should have sufficient funds to finance themselves for one quarter or at least until payments begin coming in from the Veterans Administration (approximately two months).

For further information write to the Office of Student Financial Aid, Auburn University, Auburn, Alabama.

## **Student Services**

The Dean of Student Affairs, the Dean of Women, and their respective staffs assist students with their problems and aid them in adjusting to University life. Their offices serve as general clearing houses for matters pertaining to the welfare of all students.

The Dean of Student Affairs works with individuals and groups in areas of mutual concern. His office is located in Mary E. Martin Hall. He supervises men's dormitories, campus publications, and Union activities, and he serves as adviser to organizations, fraternities, and the Student Body.

The Dean of Women's duties include matters pertaining to the welfare of all women students. As Social Director, she approves all social functions that University women attend. Also she supervises women's housing and is adviser to sororities and Associated Women Students. She and her staff have offices in the Social Center.

The academic deans, either personally or through appointed assistants, guide each student in his academic program, especially in arranging schedules, maintaining continuation in residence requirements, and satisfying subject-matter degree requirements.

The Registrar and his staff counsel students regarding registration, academic records, graduation requirements, and Selective Service regulations. The Registrar's Office is located on the ground floor of the Mary E. Martin Hall.

## **Counseling Service**

A variety of services is provided for all students free of charge by the Student Counseling Service in 305-318 Martin Hall. Students may come by the offices in person to make an appointment or call 826-4744. The offices are open from 8 a.m. to 12 noon and 1 to 5 p.m., Monday through Friday.

The staff of the Student Counseling Service thinks of counseling as a process in which the student comes to the counselor voluntarily to gain additional self-understanding that he may solve his own problems as they arise now and in the future. The counselors are concerned with helping students find solutions to their problems. They respect the ability of the students to make their own choices after they have a better understanding of themselves. Counseling is available to all students at Auburn. These services include:

**Career Counseling.** Counselors assist students in making a thorough self-appraisal of interests, abilities, and personality traits so that they may utilize this information in making a wise career choice. Counselors interpret the data from tests, discuss all possibilities of success, and help the student work through the decision-making process. Students who are indecisive about a major, or who wish information on their adaptability to selected programs of study may gain a realistic appraisal of themselves through counseling and become better equipped to make more intelligent academic choices.

**Educational Counseling.** In addition to the academic departmental advisors of the University, the Student Counseling Service provides services to students who are having academic difficulties. Attempts will be made to determine the causes of the difficulty. Counselors help students in study habits, note taking, listening skills. Educational Counseling is interrelated with other areas, and only by a complete understanding of all problems can a student's academic difficulties be alleviated.

**Personal Counseling.** Many University students have personal concerns which may interfere with their academic success. Counselors attempt to offer an atmosphere in which students may discuss such problems freely and confidentially. Personal emotional adjustment, dating, marriage, home relationships, social relationships, adjustment to college work, and plans for the future are only a few of the many concerns. Often, effective solutions can be reached by a student through a counselor-counsee relationship.

**Group Counseling.** Individual growth and development often are enhanced by experiences in small groups that meet regularly with Student Counseling Service staff members.

**Career Information Library.** The student interested in studying a curriculum or an occupation in terms of a career choice will find that this library has information about hundreds of fields. It is open 40 hours a week and no appointment is needed. Deans office counselors and professors are invited to refer students to the reading room.

**Conferences with Prospective Students.** High school seniors and college students who wish to explore curriculum offerings at Auburn University can arrange for a 30 to 40 minute appointment. Alternate dates and hours should be proposed so that the appointment will fit in with a counselor's schedule. By mail, a week or 10 days is needed as time for confirmation. If the appointment is made by telephone, the time interval may be as short as a day or two. Parents of high school seniors are invited to participate in these conferences.

## University Placement Service

The University Placement Service assists students and alumni in securing business and professional positions through its contacts with potential employers. The service is available to any student or alumnus without charge.

Representatives of commercial and industrial firms as well as government agencies visit the office each quarter for personal interviews with students.

Seniors and graduate students who desire information and placement assistance should confer with the Director, 400 Martin Hall.

## Student Health Service

The Student Health Service of Auburn University renders the following services: (1) out-patient medical and surgical service by staff doctors only; (2) hospitalization at the University Infirmary; (3) local ambulance service; (4) medical supervision of the physical education and athletic programs; (5) health education; and (6) campus sanitation. These services are administered by the medical staff of the Health Service.

The University owns and operates a 65-bed infirmary equipped with a modern clinical laboratory and X-ray facilities. Working in conjunction with the State Health Department, annual tuberculosis skin testing is available for students, faculty and employees of the institution.

Each entering student is required to file a medical examination report completed by his private physician before he can be admitted to Auburn University. Forms for this report will be furnished by the University.

The Student Counseling Service and the Student Health Service are available to students in helping them solve emotional problems. A psychiatrist is also in attendance at the Infirmary. The Infirmary also has a well-equipped physiotherapy department. A qualified physiotherapist is in attendance two afternoons each week.



No major surgery is performed in the Infirmary. Elective surgery should be performed in the student's home town, or by referral to a specialist during vacation periods or to a local surgeon. Emergency surgical operations are the responsibility of the student. Students who are in need of emergency operations and those having severe multiple or compound fractures will be referred for treatment and the expense will be a responsibility of the student. The University has available a surgical consultant who may be called when needed. The expense will be charged to the student requiring such consultation.

The Student Health Service is available to all regularly enrolled students of the institution. Medical service is not provided by the University for the families of married students, but a list of local physicians will be made available by the Student Health Service upon request.

The Out-Patient Clinic is open from 8:00 a.m. to 11:30 a.m. and 1:00 p.m. to 4:00 p.m. each week day, Monday through Friday. Clinic hours are from 8:00 a.m. to 11:30 a.m. on Saturday, and 8:30 a.m. to 9:30 a.m. on Sunday. Emergency treatment is available 24 hours daily. Visiting hours at the Infirmary are from 10:00 a.m. to 1:00 p.m., 3:00 p.m. to 8:00 p.m. each day. Only two visitors per patient are allowed simultaneously.

University physicians do not make calls outside the Infirmary or attempt to treat students in their rooms. Students who are too ill to come to the Infirmary will be furnished with local ambulance service. Parents will be notified by the University physician if a student is believed to be seriously ill.

Each student is entitled to 15 days free hospitalization at the University Infirmary during each school year. This includes professional services of the medical staff of the Student Health Service, general floor nursing care, ordinary medications, room and board, linen, routine laboratory and X-ray procedures.

The Student Health Fee does not include surgery, consultation, special X-rays, special medications, or special nurses. A charge is made for these, but only an amount sufficient to cover the cost.

The services of local physicians are available at the students' expense either at their places of residence or when properly admitted to the University Infirmary.

The Student Health Service is not available to students during the following vacation periods: Christmas holidays and the periods between the close of the Summer Quarter and the opening of the Fall Quarter.

During epidemics, the staff of the Student Health Service will make every possible effort to care for ill students at the Infirmary, but if Infirmary staff and facilities should be inadequate, the University will not assume responsibility for payment of services rendered by outside doctors or other hospitals.

## **Speech And Hearing Clinic**

The Speech and Hearing Clinic of the Department of Speech provides a full range of services for children and adults, including compre-

hensive speech and hearing examinations. Students with speech problems, or hearing problems are urged to contact the Speech and Hearing Clinic during their first quarter of residence. The Speech and Hearing Clinic also carries on a continuing program to provide assistance for all students for whom English is a second language. Appointments may be made in Room 204 Sanford for speech and/or hearing examinations or by calling 826-4682. No fees are charged for student services.

## **Student Bookstores**

Alpha Phi Omega service fraternity sponsors a non-profit bookstore on the campus. The purpose of this store is to provide a more economical means for students to purchase and sell their books. The bookstore is located in the subway of the "L" building. A University Book Store is located in the Auburn Union.

## **Student Insurance**

The Student Body sponsors an Accident and Sickness Insurance Plan which is available to all full-time or part-time undergraduate and graduate students. This Plan is underwritten by the Guarantee Trust Life Insurance Company, Chicago, Illinois, and is administered by a local insurance agency. It provides the student with maximum coverage at minimum cost. Benefits include hospital fees and expenses, surgery, visits by a physician, ambulance service, X-rays, as well as other items. Enrollment in the Plan is offered during each registration period. Further information may be obtained from the Office of Student Affairs, 304 Mary Martin Hall.

## **Student Activities**

### **The Student Body**

The student body is composed of all Auburn undergraduate students, and elects its own officers. Divided into three branches, the student government works cooperatively for the betterment of students of Auburn. Students are encouraged to take part in the political life of the campus.

### **Student Government**

Each spring members of the three-branch student government are elected. Student government controls extracurricular activities, provides members for joint student-faculty committees, and works for the welfare of the University community.

Student government is made up of the executive, legislative and judicial branches. The executive group is composed of the President, Vice President, Secretary, Treasurer, and members of the Executive Cabinet. The 21 cabinet members are known as Superintendents and are appointed by the President and approved by the Senate. In addition, there may be advisory committees to the President.

Members of the legislative branch, the Student Senate, are elected from each of the ten undergraduate schools. In addition, there are six Senators-at-Large. Students refer their suggestions to their senators, who bring them before the Senate.

The Student Jurisprudence Committee has one presiding Justice and six student Associate Justices and is vested with the Judicial Power of the Student Body. The committee interprets the Student Body constitution and renders decisions.

## **Associated Women Students**

The purpose of the Associated Women Students is to uphold high standards of scholarship, and to create, promote and maintain a high sense of honor and integrity in all phases of University life.

Each Auburn undergraduate woman student is automatically a member of AWS when she enters the University. AWS is made up of three councils: the Executive, Legislative, and Judiciary. The Legislative Council is composed of representatives of the dormitory house councils and the elected officers.

AWS plans and conducts a well-organized program for women students.

## **Student Publications**

The Auburn Engineer — published monthly for and by students in Engineering.

The Auburn Pharmacist — published quarterly by Phi Delta Chi, professional Pharmacy fraternity.

The Auburn Veterinarian — booklet published quarterly for and by students in Veterinary Medicine.

The Glomerata — student publication; production costs covered by Student Activities Fee, student organizations and advertising.

The Helm — a monthly paper published by NROTC students.

The Auburn Plainsman — a weekly paper published by students of the institution; production costs covered by Student Activities Fee and advertising.

The Tiger Cub — annual student handbook; production costs covered by Student Activities Fee and advertising.

## **The Auburn Union**

The Auburn Union is the center of non-academic student and faculty life. The building, located in the heart of the campus, provides a living room for students away from home — a place to relax, to entertain friends, and to find convenient dining services. Planned programs of social, recreational and cultural events help develop students in the art of human relations.

Located in the Auburn Union are the War Eagle Cafeteria and Snack Bar, Alumni Offices, Faculty Club, Student Government Offices, Publications Offices, Union Ballroom, meeting rooms for student organ-

izations, commuters lounges, banquet rooms, reading and TV lounges, and Union staff offices.

The main desk has become the central information center on campus. On hand are the registration cards of each student enrolled, listing class schedule, home address, and campus address.

## Cultural, Musical, Theatrical Activities

**Lecture and Concert Series.** Outstanding concert artists and nationally known lecturers are presented each year for Auburn students. Additional lectures, concerts and special programs are presented by the various Schools, and the Auburn Union sponsors frequent entertainment by popular artists. Most of these events are financed by the student activities fees; students are admitted without charge upon presentation of ID cards.

**Auburn University Theatre.** The Department of Theatre functions as producer for this organization. The season of plays reflects the commitment of the Department to expose actors, designers, technicians and teachers to a wide variety of literary theatrical forms and to present this material to the entire University and city community for its enjoyment and cultural enrichment. At present, seven productions are being offered during the regular school year. Two of these are children's plays which tour public schools in Alabama and Georgia. Students from all areas of the University and faculty members and members of the community are welcome to audition for all productions. The Auburn Players is a dramatic organization whose purpose is to promote interest and participation in the theatrical field.

**Auburn University Concert Choir** is limited to approximately 50 members, open to all students by audition. The choir sings concert and special programs on campus each quarter, takes an annual spring tour, makes regular television appearances, and sings for various functions around the state. Rehearsals are held daily, and degree credit is available.

**Choral Union**, a large chorus, is open to anyone without audition. This group usually sings two concerts a year, consisting of large choral works, often with the Auburn Symphony Orchestra. Rehearsals are held once a week and degree credit is available.

**Men's Glee Club** is open to all male students. It makes regular appearances on campus and in the surrounding area. The music is of a lighter nature, including popular music and Auburn songs. Rehearsals are held once a week, and degree credit is available.

**Marching Band.** Auburn University supports a Marching Band which frequently accompanies the football team on game trips, and represents the University at various campus, state, and out-of-town functions. It consists of approximately 140 players who receive special training in drill formations. Physical Education may be waived during the fall quarter for students who are members of the Marching Band.

**Concert Band** consists of advanced students who have passed the work of the preliminary bands, and students who are preparing to teach band in the schools. It provides music for various University activities

and some off-campus concert tours. Regular training which embodies instruction in the rudiments of music and the use of band instruments is given free of charge at the band practice periods. These activities may be taken with or without degree credit.

**Orchestra.** The Music Department sponsors this symphonic group for the development of musical talent and perfection of individual achievement in ensemble playing. Students in the early stages of musical training, especially those in violin, viola and cello, are invited to participate. Membership is by permission of the director. This activity may be taken with or without degree credit.

**Opera Workshop.** The Workshop is open to all students interested in musical or dramatic work in producing operas. Membership is open with or without degree credit. Students are trained in the various phases of operatic production largely through performances of scenes from outstanding operas.

**Educational Television.** Programs produced in the Auburn Television Studio are seen throughout the state on the Alabama ETV Network, 2, 7, 10, 25, 26, 36 and 42. Staff members in all areas of instruction, research and extension take part in this programming. The Studio offers opportunity for Auburn students in television either through regular courses, positions for observation or employment in either the technical or program production areas.

## Intramural Sports

Intramural sports offer students many opportunities to participate in competitive team and individual sports, and recreational activities. Healthful sports, good sportsmanship, and friendly competition are stressed. All students are urged to participate in the program which is entirely voluntary and largely student-supported and supervised.

Regular tournaments are offered in seasonal team and individual sports.

**Fall Quarter.** — Touch football, swimming, volleyball.

**Winter Quarter.** — Basketball, bowling, table tennis.

**Spring Quarter.** — Badminton, golf, softball, tennis, track, horse-shoes.

**Summer Quarter.** — Softball, tennis, golf, swimming, bowling.

Intramural Sports for Men also operates a check-out service in the Student Activities Building. Any student or student group may check out athletic or recreation equipment on a 24 hour or weekend basis.

## Organizations

### *National Honor Societies*

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon Delta (Pre-Medicine)  
 Alpha Lambda Delta (Freshman Scholastic—Women)  
 Alpha Psi Omega (Theatre)  
 Chi Epsilon (Civil Engineering)  
 Delta Sigma Rho—Tau Kappa Alpha (Forensics)  
 Eta Kappa Nu (Electrical Engineering)  
 Mortar Board (Student Leadership—Senior Women)  
 Omicron Delta Kappa (Student Leadership—Junior & Senior Men)

\*Phi Alpha Theta (History)  
 Phi Eta Sigma (Scholarship—Freshmen—Men)  
 Phi Kappa Phi (Scholarship—Senior Men and Women)  
 Pi Tau Sigma (Mechanical, Aerospace Engineering)  
 Psi Chi (Psychology)  
 Rho Chi (Pharmacy)  
 Sigma Pi Sigma (Physics)  
 Tau Beta Pi (Engineering)  
 Xi Sigma Pi (Forestry)

### Other National Honor Societies:

Gamma Sigma Delta (Agriculture)  
 Kappa Delta Pi (Education)  
 Omicron Nu (Home Economics)

Pi Mu Epsilon (Mathematics)  
 \*Pi Delta Phi (French)

## National Recognition Societies

The following national societies have chapters established at Auburn:

Alpha Phi Omega (Campus Service—Men)  
 Alpha Zeta (Agriculture)  
 Arnold Air Society (Air Force ROTC)  
 Angel Flight (AFROTC Coed Auxiliary)  
 Block and Bridle (Animal Science)  
 Cwens (Student Leadership—Sophomore Women)  
 Omicron Delta Epsilon (Economics)

Pershing Rifles (Air Force & Army Basic Cadets)  
 Phi Beta Lambda (Business Education)  
 Phi Lambda Upsilon (Chemistry)  
 Phi Zeta (Veterinary Medicine)  
 Pi Sigma Epsilon (Marketing)  
 Scabbard and Blade (Military)  
 Sigma Tau Delta (English)  
 Steerage (Navy ROTC)

## Campus Leadership and Service Organizations

"A" Club—Varsity lettermen in baseball, basketball, football, track or cheerleading.  
 Auburn Veterans Association—Service Organizations open to veterans of the Armed Services.  
 Circle "K" Club—International Service Club for college men sponsored by Kiwanis International.  
 \*Conservative Club—For those students interested in conservative government.  
 Spades—Honor Society of ten most outstanding senior men.  
 Squires—Honor Society for most outstanding sophomore men.  
 Towers—Independent Women's Service and Social Organization.

## Religious Organizations

Baptist Student Union—Baptist  
 The Canterbury Forum—Episcopal  
 Church of Christ Student Group—Church of Christ  
 Christian Science Organization—Christian Science  
 Jewish Hillel Group—Jewish

Liahona Fellowship—Reorganized Church of Jesus Christ of Latter Day Saints  
 Lutheran Student Fellowship—Lutheran  
 Newman Club—Catholic  
 Unitarian Universalist Fellowship—Unitarian  
 Wesley Foundation—Methodist  
 Westminster Fellowship—Presbyterian

## Departmental and Professional Organizations

Agricultural Council  
 Agricultural Economics Club  
 Agronomy Club  
 American Association of Textile Colorists and Chemists  
 American Chemical Society  
 American Institute of Aeronautics and Astronautics  
 American Institute of Architects  
 American Institute of Chemical Engineers  
 American Institute of Electrical & Electronic Engineers  
 American Institute of Interior Designers  
 American Pharmaceutical Association  
 American Society of Agricultural Engineers  
 American Society of Civil Engineers  
 American Society of Mechanical Engineers  
 Art Guild  
 \*Auburn Aero Club  
 \*Auburn Art Forum  
 Auburn Conservation Club  
 Auburn Co-operative Education Society  
 Auburn Debate Council

\*Auburn German Club  
 Auburn History Club  
 Auburn Law Society  
 Auburn Players  
 Auburn Soccer Club  
 Auburn Student Education Association  
 Auburn Tiger Sharks (Scindiving)  
 Association for Childhood Education  
 \*Association for Computing Machinery  
 Block and Bridle Club  
 Builders Guild  
 Chemistry Council  
 Collegiate 4-H Club  
 Dairy Science Club  
 Dana King Gatchell Home Economics Club  
 Delta Omicron (Music—Women)  
 Delta Sigma Pi (Business Administration)  
 Education Council  
 Engineers Council  
 Forestry Club  
 Future Farmers of America  
 Home Economics Council  
 Horticultural Forum



Industrial Arts Club  
 Industrial Design Forum  
 International Relations Club  
 Jr. American Veterinary Medical Association  
 Kappa Epsilon (Pharmacy—Women)  
 Kappa Psi (Pharmacy—Men)  
 Lambda Tau  
 \*National Collegiate Association for Secretaries  
 Omicron Kappa Pi (Interior Design)  
 Pharmacy Council  
 Phi Delta Chi (Pharmacy)  
 \*Phi Lambda Sigma (Pharmacy)

Phi Psi (Textiles)  
 Physical Education Club  
 Poultry Science Club  
 Pre-Veterinary Medical Association  
 Saddle D'Armes Fencing Club  
 Scarab (Architecture)  
 Society for the Advancement of Management  
 Science and Literature Council  
 Spiked Shoe (Varsity Lettermen in Track)  
 Sociology Club  
 Women's Recreation Association

## Student Wives Clubs

Dames Club  
 Forestry Wives Club  
 Junior AVMA Auxiliary  
 Keystone (Building Construction)

Pharmacy Wives Club  
 Wives of Auburn Engineers  
 Wives of Industrial Management Students

## Social Fraternities

Alpha Epsilon Pi Colony  
 Alpha Gamma Rho  
 Alpha Psi (professional)  
 Alpha Tau Omega  
 Beta Theta Pi  
 Chi Phi  
 Delta Chi  
 Delta Sigma Phi  
 Delta Tau Delta  
 Delta Upsilon  
 Kappa Alpha Order  
 Kappa Sigma  
 Lambda Chi Alpha  
 Omega Tau Sigma (professional)

Phi Delta Theta  
 Phi Gamma Delta  
 Phi Kappa Tau  
 Pi Kappa Alpha  
 Pi Kappa Phi  
 Sigma Alpha Epsilon  
 Sigma Chi  
 Sigma Nu  
 Sigma Phi Epsilon  
 Sigma Pi  
 Tau Kappa Epsilon  
 Theta Chi  
 Theta Xi

The Interfraternity Council regulates the relationships between the member fraternities.

## Sororities

Alpha Chi Omega  
 Alpha Delta Pi  
 Alpha Gamma Delta  
 Alpha Omicron Pi  
 Chi Omega  
 Delta Delta Delta  
 Delta Zeta

Gamma Phi Beta  
 Kappa Alpha Theta  
 Kappa Delta  
 Kappa Kappa Gamma  
 Phi Mu  
 Pi Beta Phi  
 Zeta Tau Alpha

The Pan-Hellenic Council regulates the relationships of the sororities.

\*Organizations marked by an asterisk are serving a trial period prior to official University recognition.

## Special Programs

### Correspondence Study Program

The Correspondence Study Program provides undergraduate instruction for persons unable to attend college on a regular basis. Correspondence courses parallel those given in the University and are taught by members of the University faculty. All courses carry college credit.

**Organization of Courses** — A complete course outline with full information and instructions is sent to the student upon registration. Courses consist of varying amounts of credit and numbers of units. Each work unit requires certain textbook readings and written preparation. Supplementary reading and reports may be required of the student by

the instructor on any assignment. Written work is submitted to the Correspondence Study Office.

**Qualifications** — Any person who might profit from college level courses is eligible to enroll. No entrance examination is required for admission to correspondence study, but the right is reserved to reject any applicant who does not furnish complete or satisfactory data on the formal application. Enrollment for correspondence study does not constitute admission to Auburn University.

Restrictions placed on Auburn University students regarding correspondence work are described in the regulations in Section III of the Correspondence Study Bulletin.

**Credit** — Undergraduate credit equivalent to that earned in regular college classes is given for correspondence work. Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

**Examinations** — A final examination is required in each course upon completion of all unit work. The examination should be taken in the Correspondence Study Office but may, on approval, be taken elsewhere under the supervision of an approved proctor. Proctors approved are city or county superintendents of schools, principals of accredited senior high schools, and/or deans and department heads of colleges. Students in military service may arrange to take the examination under the supervision of the Education Officer of their station.

**Fees** — Fees for correspondence courses are listed in the catalog under "Fees and Charges" (see page 32). Fees are payable in advance and should accompany the application.

For application form and further information write to Director, Auburn University Correspondence Study Program.

## Co-operative Education Program

The Co-operative Education Program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government positions.

The coordination of academic study and work experience combines theory and practice in the educational process. As a consequence, students find more meaning in their studies and their motivation is increased. This experience contributes to the development of a sense of individual responsibility. The student's judgment and maturity also develop more fully, and a better appreciation of the importance of human relations is gained. Since the employer pays the student a wage or salary during the experience quarters, this assists the student considerably in his educational expenses.

For all four-year curricula, the Co-operative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above-average scholastic record before he is placed with an employer. Transfer students are also considered for the program. Normally a student has seven experience quarters and during the senior year he remains in continuous residence in school.

For five year curricula (i.e. architecture and pharmacy) the Co-operative Education Program is a six year plan.

Students in the Co-operative Program continue their 2-S deferments whether at work or at school. Upon completion of the program, certificates are awarded by the University.

The program is offered in all curricula of the Schools of Business, Engineering and Education. Students in the Applied Physics, Architecture, Art (Visual Design), Building Technology, Industrial Design, Journalism, Mathematics, Pharmacy, Physics, Political Science, Pre-Law, Pre-Medicine and other curricula may also participate in the program.

Additional information and a booklet describing the program may be secured from the Director, Cooperative Education, Auburn University, Auburn, Alabama 36830.

# University Regulations

## Academic Regulations

Students pursuing academic programs must comply with regulations and follow procedures prescribed by the University. Regulations relating to registration, class attendance, physical education, military training, grading system, examinations, degree requirements, honors, and other academic matters are presented in the following pages.

### The University Liberal Education Program

As stated on page 9 of the catalog, the University's undergraduate instructional program requires that each student complete a component of general studies in addition to the requirements of his School or departmental major. This component is divided into a "foundation year" of coursework in English composition, world history, natural science, mathematics or logic, and physical education, and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside the student's major area; these are to be completed, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible: the development in the student of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that the student will acquire also an ability to order his thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of his culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

Requirement	Hours	Option
English Composition EH 101-2-3 (3-3-3)	9	None
World History HY 101-2-3 (3-3-3)	9	None
Natural Science	minimum of 10	Biology 101-2-3 (5-5-5) 101-4 (5-5) Chemistry 103-4 (5-5), 101-102-104 (2-3-5) Geology 101-2 (5-5) Physics 220-1-2 (4-4-4) 204-5-6 (5-5-5)
Mathematics or Logic	minimum of 5	Mathematics 100 (5), 159-161 (5-5), 160-61 (5-5) Philosophy 211-212 (3-3)
Physical Education	3	See p. 251 for the various options for meeting this requirement offered by the Department of Health, Physical Education and Recreation.
Electives	minimum of 20	A minimum of 20 additional hours of liberal education studies are to be taken by each student; these will consist of course-work in two broad academic areas other than that in which his own major field lies (Humanities and Fine Arts, Social Sciences, Mathematics and Natural Science), with no less than one course in each area.

The minimal University requirements for all students are listed on preceding page; however, individual Schools and departments may increase the number of hours in this component of their undergraduate programs, and the student should consult the appropriate curriculum model in his School for complete requirements.

## Class Enrollment And Attendance

### *General Requirements*

**Class Attendance.** Students are expected to attend punctually every recitation, laboratory exercise, and other University duties.

**Registration.** The orientation of new freshmen and registration of new and previously enrolled students will be held each quarter as indicated in the University Calendar. A service charge will be made for registration after the official dates listed in the University Calendar. (See section on Fees and Charges, page 32.)

Every student is required to be registered in Auburn University in his quarter of graduation or in any other quarter when, in clearing an "incomplete" grade, working on a graduate thesis, or engaged in any other endeavor relating to his normal progress as a student, he makes use of the instructional staff and the facilities of the University. A fee is charged for such late registration. (See page 32.) Registration in a correspondence course through Auburn University satisfies this requirement.

**Late Enrollment.** After the date specified in the University Calendar as the last day for final registration, no student may register except by permission of the dean. The load of a student who registers late shall be reduced at the discretion of his dean and an extra service charge will be made. No student will be registered after the tenth day of classes. (See page 32.)

**Back Work.** In arranging a student's work for each year the dean will require him to schedule first the back work of the lower class or classes, but where this would work a serious hardship on the student the dean may make such exceptions as he deems necessary.

**Prerequisites.** Prerequisite or corequisite requirements of courses are listed with the course descriptions in the University catalog. It is the responsibility of the student to know these requirements and to comply with them when registering.

Any waiver of these requirements must be approved by the instructor concerned or his department head. In addition the waiver of the junior standing prerequisite established for courses that may be taken for graduate credit must have the approval of the Dean of the Graduate School.

**Student Load.** The maximum load for students enrolled in undergraduate curricula is 19 quarter hours. A normal quarterly load is from 15 to 19 hours. Upon approval of his dean, a student may schedule less than a normal load.

The maximum load may be exceeded only under the following circumstances:

- (a) The academic dean may approve up to 20 hours as a "convenient load."
- (b) Upon approval of his dean, a student may schedule an overload not to exceed 23 hours if, during his last residence quarter at Auburn University in which he carried 15 or more hours, he passed all work attempted and earned a grade point quotient of 1.5 or higher. A student who has scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if he has passed all work carried with a minimum grade point average of 1.5 in each intervening quarter. In special cases the dean may make exceptions to the 1.5 requirement by written notice to the Registrar.
- (c) Upon approval of his dean, a graduating senior who is ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow him to graduate in that particular quarter.

A student who registers for work in excess of his approved load may be required by his dean to drop the overload during the Schedule Adjustment Period.

**Change in Program.** A student is required to have approval of his dean before changing his program of studies. A fee (see page 32) will be charged for each change in schedule and for change in curriculum after the schedule adjustment period ends when such changes are not required or advised by the University.

A grade of "Withdrawn" (W) will be assigned when the student drops a course with the permission of the dean within the first two weeks of a quarter, or when he is permitted for special reasons to drop the course without penalty after this period.

A grade of "Withdrawn Failing" (WF) will be recorded in the Registrar's Office for a subject dropped on request of the student after the second week of a quarter. Exceptions are made only as authorized by the dean.

A student's dean may make such substitutions as he deems necessary in the student's course of study. The student's load may also be reduced by the dean when circumstances seem to make it advisable.

**Classification.** Each undergraduate student will be classified according to the number of quarter credit hours he has earned at Auburn University and other institutions as follows: Freshman, 47 or fewer; Sophomore, 48 to 98; Junior, 99 to 152; Senior, 153 or over.

A student who has been awarded one baccalaureate degree and pursues another course for a second baccalaureate degree will be classified as an undergraduate student.

Students who for reasons acceptable to the dean do not wish to pursue regular courses either as to load or curriculum will be admitted as unclassified students.

**Auditing Privilege.** Because of heavy enrollment in most academic departments, the privilege of auditing courses is restricted. Auditing



of a lecture course or the lecture part of a combined lecture and laboratory course may be granted with the approval of the student's dean and the head of the department in which the course is offered. The auditing privilege is rarely permitted in laboratory or combined lecture and laboratory courses.

Auditors must complete the regular registration process and are listed on class rolls, but are not required to participate in classroom discussions, take tests or final examinations, or make reports; no grades or credits may be received. Auditors who have not been admitted to the University must make application to, and secure a registration permit from, the Admissions Office. Former students secure a registration permit from the Registrar's Office. Auditors who are not regularly enrolled students will register on the last day of the final registration period. A fee (see Auditing Fee on page 32) will be charged for auditing a lecture course. Regularly enrolled students carrying 10 hours or more and members of the faculty may audit lecture courses, without payment of the auditing fee with approval of the head of the department in which the course is offered and the individual dean; however, the regular registration process must be completed.

**Curriculum Transfer.** If a student transfers from one curriculum to another requiring more hours, the graduation requirements of the new curriculum must be met as far as hours and subject matter are concerned.

For students transferring from other institutions, credit will be allowed for ROTC and Physical Education satisfactorily completed, on the same basis as if the work were taken at Auburn.

A student who is excused for any reason from any subject will be required to substitute other approved work.

**Resignation.** After the date carried in the University Calendar for mid-quarter, no student may resign from school and escape the penalty of failure. After this date, the dean shall contact the student's instructors to determine his scholastic standing at the time of resignation and report such standing to the Registrar. If the student is failing in over half his work, he will be charged with one quarter of residence and the number of hours reported as failing.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in determining whether a scholastic penalty is to be assigned shall rest with the student's dean. See "Rules and Regulations for Students" in *The Tiger Cub* for detailed regulations.

**English Requirements.** All students are expected to maintain a reasonable standard of good English usage, oral and written. Instructors in all curricula are directed to insist on clear, effective, and accurate speaking and writing in all class work. No substitution for the freshman English requirement is permitted.

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than "C" will be accepted:

1. If the transfer student has fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If he has three quarter hours credit in the first course of an English composition sequence, he must complete both EH 102 and 103.
2. If the transfer student has four quarter hours of credit in the first course of a three-course sequence he must complete EH 102 and 103.
3. If the transfer student has either four or five quarter hours of credit in the first course of a two-course sequence, he must complete EH 103.
4. If the transfer student has three semester hours of credit in the first course of a two-course sequence, he must complete EH 103.
5. If the transfer student has earned eight or more quarter hours and has met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school. Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are excused from meeting these regulations.
6. No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that "F", but must repeat the course in residence at Auburn.

All transfer students are directed to clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

### ***Physical Education***

**University Requirements.** Physical education is required for three (3) consecutive quarters. Only one credit per quarter is permitted or transferable to meet the three (3) quarter requirement.

Unless otherwise approved by the student's dean, each student who lacks physical education must register for an activity course in the first and succeeding quarters of residence until all requirements are met or until he becomes 26 years of age.

**Transfer Students.** Students transferring from an institution not requiring physical education will have their physical education requirements reduced by the number of full-time quarters (15 hours credit per quarter) in residence at the former institution. Students who transfer from an institution requiring physical education will have their physical education requirements reduced by the number of quarters of physical education completed at the former institution. Students who have not fulfilled the requirements in physical education at their previous institution will be required to do so at Auburn University before graduation.

**Health Classification.** A medical examination is required of all students before being admitted to classes. A card stating the physical condition of each student must be filed in the infirmary and the Department of Health, Physical Education and Recreation before assignment of activities can be approved. Classifications are:

- (A) Regular — This classification permits the student to engage in any activity offered by the Department.
- (B) Adapted — This classification provides for the student with physical limitations which may restrict his participation in the regular program of activities.
- (C) This classification provides for the student with physical limitations requiring program adaptation to his individual needs.

## **Military Regulations**

### ***Reserve Officers Training Corps***

Three Military Services — Army, Navy, and Air Force — are represented by ROTC Units at Auburn. Entering freshmen may enroll in the ROTC of their choice at registration, subject to class capacities, except that students enrolled in Naval ROTC are selected by the Professor of Naval Science prior to registration.

Eligibility for enrollment in the Advanced Course of any ROTC will be subject to departmental policies, criteria, and quota limitations.

**Military Training (Basic ROTC).** Students enrolling in college for the first time and transfer students not otherwise excused are required to register for and attend scheduled military classes (Basic Course ROTC) in the first and succeeding quarters of residence until military training requirements have been met. Successful completion of the Basic Course (Army, Navy, or Air Force ROTC) is a prerequisite for graduation of all male students except as noted below:

a. Students physically disqualified for military service under current standards prescribed by the Departments of Army, Navy, and Air Force as determined by the respective commandant with the advice of the University physician when his evaluation is appropriate.

b. Veterans with 6 months or more honorable active military service in the U.S. Armed Forces. See also paragraph (4) on page 54.

c. Students more than 23 years of age prior to enrolling at Auburn for the first time are excused from Basic military training.

d. Transfer students from institutions not requiring military training will have the basic military requirement reduced by the number of full-time quarters satisfactorily completed in residence at the former institution provided that military training will not be required if the student has completed five full quarters (minimum of 15 hours per quarter). A student who transfers from an institution requiring military training will have his basic military requirement reduced by the number of quarters of military training completed at the former institution. A transfer student contemplating advanced ROTC should consult with the head of the service in which he is interested.

e. Students with outstanding records in ROTC training at regularly established Junior ROTC Units approved by The Department of Defense, may be excused from the first year Basic Course provided the student has completed with credit three (3) years of Junior ROTC, applies for waiver, and possesses a Certificate of Eligibility from the PMS of the Junior ROTC Unit. In no case will a student in this category be excused from more than the first year Basic Course. If so excused, enrollment in the second year Basic Course will be made at the beginning of the Sophomore year.

f. Students completing MS 12 or the equivalent at a military school accredited by the Department of Defense may have the first year of ROTC waived.

g. Students who are not citizens of the United States.

**Selective Service Deferrals.** For regulations concerning Selective Service deferment based on enrollment in ROTC programs, see description carried in this catalog under the particular division: Air Force Aerospace Studies; Military Science; Naval Science.

**Military Service Credit.** Applicants who have served in the Armed Forces, upon submitting to the Registrar the official separation form (DD Form 214), may be allowed credit toward advanced standing for service experience as follows:

(1) Courses completed in military service programs at the college level insofar as they fit into the student's curriculum as required subjects or as electives, as approved by the dean concerned.

(2) Officer candidate and special service training not strictly organized as college courses, and other formal or informal off-duty training. Credit may be allowed toward advanced standing by the dean after review by the Registrar and the dean concerned of the official separation record and, as required, after passing with satisfactory scores or grades any field or subject examinations given through the Armed Forces Institute or by the department concerned. Credit for college level General Educational Development Tests is allowed as approved by the dean concerned, except that no credit is allowed in English.

(3) Correspondence courses. Credit may be allowed for college level courses completed by correspondence through the Armed Forces Institute, institutions approved by the Armed Forces Institute, and other accredited institutions as approved by the dean concerned.

(4) Veterans eligible to attend under the G.I. Bill of Rights, the Korean War Bill, or Cold War G.I. Bill will be excused from Basic ROTC training not previously completed and will be allowed college credit as follows:

Commissioned Officers — 12 Quarter Hours

Others — 6 Quarter Hours

(Duplicate credit is not allowed where ROTC courses have been completed prior to military service.)

Students who have completed a six-months Reserve Active Duty for Training Program (ACDUTRA) resulting in an honorable separation and who have not completed Basic ROTC requirements prior to

military service may be given college credit for three quarters (usually the first year) of the ROTC Basic Course. No college credit will be awarded if the Reserve Active Duty for Training Program was less than six months duration; however, the student may be excused from attending three quarters of Basic ROTC training if the ACDUTRA was of four (4) months duration. Other students who have completed terms of military service resulting in an honorable separation, will be given college credit as follows:

For 6 to 12 months — Three quarters of the ROTC Basic Course (three quarter hours) usually taken in the first year.

12 months or more — The entire Basic ROTC Course (6 quarter hours).

Any student who is interested in the Advanced Course offered by the Departments of Air, Military, or Naval Science shall complete as much of the Basic ROTC Course as may be prescribed as prerequisite by the Department concerned, or complete a summer basic training period in lieu of the two-year ROTC program required for freshmen and sophomores. Application for the Navy's Advanced Contract NROTC program should be made to the Professor of Naval Science in January or February of the year the student plans to enter.

(5) The Basic ROTC requirement will be waived for successful completion of the training required to become a federally recognized officer in the National Guard of any state. A total of six quarter hours of credit will be allowed, including any Basic ROTC credit earned in residence.

(6) Students who have had active military service may receive credit in physical education as follows: for less than six months, no credit; for six months to one year, one quarter hour in Foundations of Physical Education, HPR 101; for more than one year, two (2) quarter hours (less any completed prior to military service) plus one (1) quarter hour in swimming if the student passes the Departmental Proficiency Test.

## Examinations And Grades

### *Grading System*

Final grades are assigned as follows: A, Superior; B, Good; C, Acceptable; D, Passing; S, Satisfactory; U, Unsatisfactory; F, Failure. Grade points are assigned as follows: A — 3; B — 2; C — 1; D — 0; F — 0. For graduate students see Graduate School section.

A grade of "Incomplete" (IN) is assigned when the quality of work has been of passing grade, but the student has been prevented by illness or other justifiable cause from completing the work required prior to the final examination. If the student is both "Incomplete" in his work and absent from the final examination, the grade of "Absent Examination" (X) shall be assigned. When a grade of "Absent Examination" (X) is reported, the instructor shall indicate whether or not the quality of work has been of passing grade. If passing, a grade of "X" is assigned; if not passing, the grade shall be "XF." Grades of "In-

complete" and "Absent Examination" in required subjects not cleared within one resident quarter shall be repeated. Graduating seniors must clear all incompletes (IN) and absent examination (X) within the first two (2) weeks of their graduating quarter. Graduate students shall remove incomplete grades within a reasonable time and will not be allowed to graduate with grades of "Incomplete" on their records. A student absent from a final examination for any reason other than personal illness must obtain an excuse from the respective dean in order to take the examination.

A grade of "Withdrawn" (W) will be assigned when the student drops a course with the permission of the dean within the first two weeks of a quarter, or when he is permitted for special reasons to drop the course without penalty after this period. A grade of "Withdrawn Failing" (WF) is assigned to a course dropped with penalty.

If a student is dropped for excessive absences, a grade of "FA" is assigned. (See *Tiger Cub* for detailed regulations concerning the "FA" grade.)

### ***Examinations and Reports***

Examinations are classified as (1) final examinations at the end of each quarter and (2) special examinations. Grades in all subjects are reported to the student's parents or guardians at the end of each quarter. Fees for special examinations are found on page 34. A student absent from an examination for any reason other than personal illness must obtain an excuse from the respective dean in order to take the examination. Examinations missed because of illness must be excused by the University Physician.

For detailed regulations governing special examinations, see "Rules and Regulations for Students" in *The Tiger Cub*, the student handbook.

**Announced Quizzes.** At least two announced one-hour quizzes shall be held in each subject during the quarter, one in the first half of the quarter and the other in the last half. Other quizzes may be given as deemed necessary by the instructor and department head.

**Re-admission of Former Students.** Students who have attended Auburn University and desire to re-enter must secure a registration permit from the Registrar's Office. Students who have attended another institution for one (1) quarter or semester must be eligible to re-enter the institution attended. Students attending another institution for more than one (1) quarter or semester must also have earned an overall "C" average to be eligible to re-enter Auburn University. Two (2) Transcripts must be furnished to the Registrar's office from the institution attended.

**Mid-Quarter Deficiencies.** Deficiencies are reported at the end of the fifth week in each quarter.

### ***Dean's List***

A full-time student (minimum of 15 quarter hours) passing all credit hours of work carried during a quarter and attaining a scholastic record within the upper five per cent of the records attained by the



full-time students enrolled in his school may be designated an honor student for that quarter. The honor attained will be recorded on the Dean's List and on the student's permanent record.

## **Academic Eligibility**

### ***Continued Residence***

Auburn University may place a student on probation or suspend him at any time if he flagrantly neglects his academic work or makes unsatisfactory progress toward graduation.

### ***Academic Probation***

Any student enrolled at Auburn University will be placed on academic probation whenever the total number of hours he has attempted at Auburn University exceeds total grade points earned by more than 12, except that no entering freshman will be placed on academic probation on the basis of his first quarter's work at Auburn.

### ***Clearing Probation***

A student may clear a probation by reducing his grade point deficiency to 12 or fewer grade points.

### ***Academic Suspension***

A student on probation will be placed on academic suspension for two quarters whenever the number of hours he has attempted at Auburn University exceeds grade points earned by more than 21. However, such a student will not be placed on academic suspension at the end of a quarter in which he earns a 1.0 (C) average, but he will be continued on academic probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. A student will be re-admitted on academic probation following the expiration of his first suspension. A student who incurs a second academic suspension is placed on indefinite suspension and can be re-admitted only on special approval by the Admissions Committee on the basis of adequate evidence of ability, maturity and motivation. Generally, a student must be on indefinite suspension at least four quarters before his application for re-admission will be considered.

A student whose eligibility to register cannot be determined because of deferred grades may be permitted to register conditionally until his status is determined. Conditional grades must be cleared within two weeks of the beginning of the quarter.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

Suspensions incurred prior to implementation of the above regulations shall not be counted when determining a student's academic status.

Students enrolled in the School of Veterinary Medicine who fail to make a grade point average of 1.25 in any quarter will be placed on academic probation. Students on academic probation who fail to make a 1.25 in the following quarter may be dropped from the School of Veterinary Medicine. Students who make a grade of F on any course may be required to withdraw from the School of Veterinary Medicine. If re-admitted such students may be required to repeat certain other courses in the curriculum for that quarter.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in college. The scholastic penalties incurred while enrolled in the School of Veterinary Medicine will become a part of the student's record.

## Degree Requirements

To qualify for graduation, a student must complete the courses and hours specifically required and accepted for his curriculum with a grade point average of 1.0 (C). A student who transfers from another institution must earn grade points equal in number to the additional hours required at Auburn University for completion of the curriculum. If courses by correspondence and extension are accepted, the number of grade points allowed will not exceed the number of credit hours so completed.

Not more than 10 quarter hours of the final year's work may be obtained through extension or correspondence courses, or both, unless the student has completed a full load in residence previously for one full session of 36 weeks, in which case credit will be allowed for a total of 18 quarter hours in either extension or correspondence, or a combination of the two. All credit hours earned by correspondence or extension will be counted as any other credit hours earned toward meeting graduation requirements but will not be included in the calculation for continuation in residence.

Degrees are conferred at Commencement Exercises held at the close of each quarter. A degree will not be conferred in absentia without official permission of the student's dean.

The graduation fee (page 32) must be paid at the beginning of the quarter of graduation at the Bursar's Office.

No student will be issued a diploma or statement of credits if he is in default on any payment due the University or any school or division thereof.

**Residence Requirement.** To obtain a bachelor's degree a student must complete the final year of work at Auburn University. This regulation may be waived, at the discretion of the dean, for men who entered military service from Auburn University and completed work while on active duty. A student must be enrolled in the specified curriculum of graduation for three quarters and complete the hours required for the last year of work.

**Second Degree.** A minimum of 45 quarter hours and 45 grade points and 36 weeks of residence is required for a second baccalaureate

degree by a graduate of Auburn University. The minimum requirements for a second baccalaureate degree for a graduate of another institution are completion of the hours required in the final year of the curriculum with an equal number of grade points and 36 weeks of residence at this institution. A minimum of 45 quarter hours and 36 weeks of residence is required for a master's degree.

## **Off-Campus Credit**

### ***Extension and Correspondence Courses***

The following regulations govern extension and correspondence courses: (1) Credit for undergraduate courses in extension and/or correspondence in the major subject or for requirements for the baccalaureate degree shall not exceed, including transfer credits so earned, 10 per cent of the total credit required. (2) Credit hours earned by correspondence or extension will be counted as any other credit hours earned toward meeting the requirements for graduation, but will not be included in the calculation for continuation-in-residence. Grade points will be assigned to such work toward meeting the requirements for graduation, but in no case will the number of grade points exceed the number of credit hours so earned. (3) Credit for extension and correspondence courses to be taken at Auburn or elsewhere must be approved in advance by the student's dean. (4) No student in residence may enroll for a correspondence course if he can schedule the course or a suitable substitute. (5) No student shall receive credit for correspondence work which, with courses taken in residence, makes a total load exceeding the maximum allowed under college regulations.

In addition to the above, students taking work under the Auburn University Correspondence Study Program are subject also to its regulations as outlined on page 45. For further information, course listing, and application form request a Correspondence Study Bulletin from the Director, Correspondence Study Program, School of Education, Auburn University.

### ***Off-Campus Center Credit***

Permission to take work at a university off-campus center other than at Auburn University — Montgomery is at the discretion of the dean and within the established relationships between the center and the comparable school or college in the parent university of the center. It shall be the responsibility of the student to secure and file with his dean a statement from the center that he may use credit in the desired course toward meeting requirements for the appropriate degree assuming his enrollment at the parent university under comparable classification and circumstances.

### ***Graduation Honors***

Students clearing graduation requirements with exceptionally high scholastic records who have completed in residence at Auburn University not less than six quarters of the work required in their curricula

are graduated with distinction. The distinction attained will be recorded on the student's diploma and placed on his permanent record.

A transfer student who has completed at least six quarters of work in residence at Auburn University is eligible for graduation honors if he meets both of the following requirements: (1) his grade point quotient on all work taken in residence at Auburn University meets the minimum requirements for the honor and (2) his over-all grade point quotient on all work taken in residence at Auburn University and elsewhere meets the minimum requirements for the honor.

A transfer student may not be graduated with a degree of distinction higher than that for which he would be eligible on the basis of his Auburn University record, and where his over-all average is lower than his Auburn University record, the degree of distinction earned will be determined by his over-all grade point quotient.

A student whose record at Auburn University fails to meet the requirements established for one of the degrees of distinction may not be graduated with honors regardless of his record elsewhere.

In determining graduation honors, all work attempted in residence except remedial subjects and subjects cleared with the "S" (satisfactory) grade, will be used in the calculations. Where transfer credits are considered, calculations will be based on the grade point values in use at Auburn University.

The grades of distinction and requirements are: With Honor, a grade point quotient of at least 2.4; With High Honor, a grade point quotient of at least 2.6; and With Highest Honor, a grade point quotient of at least 2.8.

## Special Regulations

For complete information regarding all Special Regulations, see "Rules and Regulations for Students" in *The Tiger Cub*, the student handbook.

### *Automobile Registration*

Registration of four-wheel motor vehicles will be a part of the academic registration procedure at the beginning of the Fall Quarter each year for all undergraduate and graduate students that are permitted to bring cars to Auburn and will be part of the registration procedure at the beginning of the Winter, Spring and Summer Quarters for all students not already registered.

Students who bring unregistered cars, scooters or motorcycles on the campus after any registration period must register them at the University Security Office, Department of Buildings and Grounds, immediately after arrival on the campus. Faculty and staff members shall register their cars at the University Security Office. Failure to register a four-wheel vehicle, to use the proper decal and to park in the proper zone will constitute a violation and subject the violator to certain penalties.

Freshmen are not permitted to bring cars to the Auburn Community unless required for commuting. Generally, those staying or living one-half mile or further beyond the edge of the main campus will be considered commuters.

Junior, Sophomore and Freshman commuters must register for zone "D" and are not permitted to park or operate a vehicle on the main campus during normal school hours.

The above is general information subject to modification by the beginning of the Fall Quarter, 1969. For specific up-to-date information regarding designated parking area, traffic regulations and controls, violations and penalties, secure a copy of the "Parking and Traffic Regulations" from the University Security Office.

### ***Discipline***

1. Each student, by act of registration, obligates himself to obey all rules and regulations.

2. Students are expected to conduct themselves along the lines of good citizenship by obeying the laws of the United States, the State of Alabama, the City of Auburn, and the University. Enrollment as a student in no way exempts any person from penalty in case of violation of local, state or national laws. (See Student Handbook for detailed regulations relative to discipline.)

3. All publications supported by the Student Activities Fee are subject to supervision by the Board of Student Publications.

# School of Agriculture

E. V. SMITH, *Dean*

CHARLES F. SIMMONS, *Associate Dean*

R. D. ROUSE, *Assistant Dean*

THE SCHOOL OF AGRICULTURE prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal Science, Dairy Science, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Management, Entomology, Zoology, and Marine Biology; Food Science; Forest Management; Ornamental Horticulture; and Wood Technology. If a student is permitted to major in a field where the courses are not prescribed in the catalog he should consult with the head of the department concerned.

The School of Agriculture also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Credit will not be allowed for agricultural subjects taken at non-land-grant colleges unless the student passes validating examinations in such subjects after entering Auburn. Arrangements for these examinations must be made with the Dean of Agriculture in the first quarter of the student's enrollment in the School of Agriculture at Auburn and the examinations must be completed before the middle of the second quarter.

## Curriculum in Agricultural Science (AG)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
BI 101 Prin. of Biology.....4	BI 102 Gen. Plant Biology.....4	CH 104 Fund. Chem. II.....4
BI 101L Biology Lab.....1	BI 102L Biology Lab.....1	CH 104L Chemistry Lab.....1
EH 101 English Composition.....3	CH 103 Fund. Chem. I.....4	EH 103 English Composition.....3
HY 101 World History.....3	CH 103L Chemistry Lab.....1	HY 103 World History.....3
*MH 160 Algebra & Trig.....5	EH 102 English Comp.....3	MH 161 Anal. Geom. & Calc. 5
MS Military Training.....1	HY 102 World History.....3	MS Military Training.....1
	MS Military Training.....1	

\*Credit toward a degree in any curriculum in the School of Agriculture will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take a lower level course without degree credit.



## SOPHOMORE YEAR

## First Quarter

AH 200	Intr. An. Husb.	5
BI 103	Gen. An. Biology	4
BI 103L	Biology Lab.	1
PS 204	Found. of Physics	5
MS	Military Training	1
PE	Physical Education	1

## Second Quarter

AS 202	Agr. Economics	5
CH 207	Organic Chemistry	5
HF 201	Orchard Mgh.	5
MS	Military Training	1
PE	Physical Education	1

## Third Quarter

AH 204	An. Biochem. & Nutr.	5
AY 201	Prin. Grain Prod'n.	5
DH 200	Fund. of Dairying	5
MS	Military Training	1
PE	Physical Education	1

## JUNIOR YEAR

PH 301	Gen. Poultry	5
SP 202	Applied Oral Commun.	3
**Agr. Eng. Elective		5
Elective		5

BY 306	Fund. Plant Phys.	5
BY 309	Gen. Plant Path.	5
JM 315	Agr. Journalism	3
Elective		5

AY 304	General Soils	5
HF 308	Veg. Crops	5
**Agr. Eng. Elective		5
Elective		3

## SENIOR YEAR

AY 401	Prin. Forage Prod.	5
FY 313	Farm Forestry	5
Elective		5
Elective		3

AS 501	Agr. Marketing	5
AY 404	Fiber & Oil Crops	5
Elective		5
Elective		3

AH 401	Swine Production	5
AS 401	Farm Management	5
ZY 402	Econ. Entomology	5
Elective		3

Total — 210 quarter hours

\*\*To be selected from AN 350, 351, 352, and 353.

## Major in Agronomy and Soils (AY)

## FRESHMAN YEAR

## First Quarter

CH 103	Gen. Chem.	4
CH 103L	Gen. Chem. Lab.	1
MH 160	Alg. and Trig.	5
HY 101	World History	3
EH 101	English Comp.	3
MS	Military Training	1

## Second Quarter

BI 101	Prin. of Biology	4
BI 101L	Biology Lab.	1
CH 104	Gen. Chem.	4
CH 104L	Gen. Chem. Lab.	1
HY 102	World History	3
EH 102	English Comp.	3
MS	Military Training	1

## Third Quarter

BI 102	Gen. Plant Biology	4
BI 102L	Biology Lab.	1
MH 161	Anal. Geom. & Calc.	5
HY 103	World History	3
EH 103	English Comp.	3
MS	Military Training	1

## SOPHOMORE YEAR

AY 201	Prin. of Grain Prod.	5
BI 103	Gen. Animal Biology	4
BI 103L	Biology Lab.	1
CH 207	Organic Chem.	5
MS	Military Training	1
PE 101	Physical Education	1

AH 204	An. Biochem. and Nutrition	5
CH 105	Gen. Chem.	3
CH 105L	Gen. Chem. Lab.	2
GL 101	Geology	5
MS	Military Training	1
PE 102	Physical Education	1

PS 204	Physics	5
AH 200	Intr. An. Husb.	5
or		
DH 200	Dairying	5
AY 304	Gen. Soils	5
MS	Military Training	1
PE 103	Physical Education	1

## JUNIOR YEAR

AN 350	Soil & Water Tech.	5
AS 202	Agr. Economics	5
BY 306	Fund. of Plant Physiology	5
SP 202	Applied Oral Communication	3

AY 406	Com. Fertilizers	3
HF 308	Vegetable Crops	5
*Elective		10

ZY 300	Genetics	5
AY 306	Soil Morphology & Survey	5
JM 315	Agr. Journalism	3
Elective		5

## SENIOR YEAR

AS 401	Farm Mgt.	5
AY 401	Prin. of Forage Prod.	5
FY 313	Farm Forestry	5
Elective		3

AY 404	Fiber and Oil Crops	5
BY 509	Plant Pathology	5
Elective		8

AY 402	Soil Fertility	5
ZY 402	Econ. Ent.	5
Elective		8

Total — 210 quarter hours

\*The student must take at least 5 hours from AN 351, 352, 353, and 354, and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

## Major in Animal Science (AH)

## FRESHMAN YEAR

## First Quarter

AH 200	Intr. An. Husb.	5
CH 103	Fund. of Chem. I	4
CH 103L	Chemistry Lab.	1
MH 160	Alg. & Trig.	5
MS	Military Training	1
PE	Physical Education	1

## Second Quarter

CH 104	Fund. of Chem. II	4
CH 104L	Chemistry Lab.	1
EH 101	English Comp.	3
HY 101	World History	3
MH 161	Anal. Geom. & Calc.	5
MS	Military Training	1
PE	Physical Education	1

## Third Quarter

BI 101	Prin. of Biology	4
BI 101L	Gen. Prin. Biology Lab.	1
CH 207	Organic Chem.	5
EH 102	English Comp.	3
HY 102	World History	3
MS	Military Training	1
PE	Physical Education	1

## SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
BI 102	Gen. Plant Biology .4	AH 204	Animal Biochem. & Nutr. .5	AH 309	Live An. Eval. .5
BI 102L	Gen. Plant Biology Lab. .1	BI 103	Gen. Anim. Biology .4	AS 202	Agr. Economics .5
CH 208	Organic Chemistry .5	BI 103L	Gen. Anim. Bio. Lab. .1	JM 315	Agr. Journalism .5
EH 103	English Comp. .3	PG 211	Psychology I .3	ZY 300	Genetics .5
HY 103	World History .3	SP 202	Oral Communication .3	MS	Military Training .1
MS	Military Training .1	MS	Military Training .1		

## JUNIOR YEAR

AH 406	Anim. Reproduction .5	AH 403	Animal Breeding .5	ZY 402	Economic Ento. .5
PS 204	Found. of Physics .5	AY 304	General Soils .5		Electives .13
VM 200	General Microbiol. .5	VM 421	Gen. An. Physiology .5		
	Electives .3		Electives .3		

## SENIOR YEAR

AS 401	Farm Management .5	AH 408	Adv. An. Nutrition .5		Electives .18
	Electives .13	AH 411	Seminar .1		
			Electives .10		

## Total — 210 quarter hours

Students desiring to major in Animal Science will be assigned an advisor. A major may elect either a Terminal Degree Option or a Graduate Preparatory Option and will during his sophomore year with the assistance and approval of his advisor, develop a plan of study for the junior and senior years from lists of approved elective courses shown on back. As approved by the Dean of Agriculture and the student's advisor, substitutions may be permitted to meet specific needs of individual students.

## Dairy Science

The Department of Dairy Science offers a program of study with two main options — Science and Production Technology. Students are encouraged to take the Science option if they anticipate the possibility of advanced study beyond the B.S. degree. Such advanced study is necessary in preparing for positions in teaching, extension education and research in universities and dairy-allied industries.

The option in Production Technology provides for a selection of courses important in modern, automated milk production operations, for positions as specialists with milk companies, feed companies, other allied industries and in preparation for foreign assignments in the area of animal food production. Faculty advisors of students choosing this option will recommend a proper balance of elective courses in economics and business and in technical agriculture.

## Major in Dairy Science (DH)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Composition .3	EH 102	English Composition .3	EH 103	English Composition .3
HY 101	World History .3	HY 102	World History .3	HY 103	World History .3
CH 103	Fundamentals of Chem. .4	CH 104	Fundamentals of Chem. .4	BI 101	Prin. of Biology .4
CH 103L	Fund. of Chem. Lab. .1	CH 104L	Fund. of Chem. Lab. .1	BI 101L	Prin. of Biol. Lab. .1
MH 160	Algebra and Trig. .5	MH 161	Anal. Geom. & Calc. .5	PG 211	Psychology I .3
LY 101	Use of Library .1	MS	Military Training .1	PA 211	Intr. to Deductive Logic .3
MS	Military Training .1	MS	Military Training .1	MS	Military Training .1

## SOPHOMORE YEAR

BI 102	Gen. Plant Biology .4	BI 103	Gen. Animal Biology .4	PS 204	Physics or PS 205* .5
BI 102L	Gen. Plant Biology Lab. .1	BI 103L	Gen. Animal Biol. Lab. .1	AH 204	Animal Biochem. & Nutr. .5
AS 202	Agr. Economics .5	VM 200	Gen. Bacteriology .5	EH 345	Business & Professional Writing .5
CH 203	Organic Chem.* or CH 207 .5	JM 315	Agr. Journalism .5	MS	Military Training .1
MS	Military Training .1	PE	Physical Education .1	PE	Physical Education .1
PE	Physical Education .1		Elective .3		

\*Students choosing the science option will be advised to take CH 207 instead of CH 203 and PS 205 instead of PS 204. Other recommended electives will include CH 105, CH 208, PS 206, and such courses as MH 162, ZY 301, ZY 409, and DH 401. The recommended electives for students interested in production technology will include such courses as DH 401, AS 301, AS 303, EC 211-212, EC 341, IE 301, and ZY 402.

JUNIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
DH 200	Fundamentals of		DH 101	Man's Food	3
	Dairying	5	ZY 300	Genetics	5
SP 202	Applied Oral		VM 421	Animal Physiology	5
	Communication	3		Recommended	
AY 304	General Soils	5		Elective*	3
	Recommended				
	Elective*	5			

SENIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
AS 401	Farm Management	5	DH 408	Processing Dairy	
	Recommended			Products	5
	Electives*	13	AH 403	Animal Breeding	5
			DH 402	Artificial	
				Insemination	3
				Recommended	
				Elective*	5

Total — 210 quarter hours

### Major in Horticulture (HF)

FRESHMAN YEAR			Third Quarter		
First Quarter			Second Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3
BI 101	Prin. of Biology	4	BI 102	Gen. Plant Biology	4
BI 101L	Prin. of Biol. Lab.	1	BI 102L	Gen. Plant Biol.	
MH 160	Alg. and Trig.	5		Lab.	1
HF 101	Intr. to Hort.	1	HY 101	World History	3
MS	Military Training	1	CH 103	Fund. Chemistry	4
PE 101	Phys. Training	1	CH 103L	Gen. Chemistry	
				Lab.	1
			MS	Military Training	1
			PE 102	Physical Education	1

SOPHOMORE YEAR			Third Quarter		
First Quarter			Second Quarter		
HY 103	World History	3	AS 202	Agr. Economics	5
BI 103	Gen. Animal Biology	4	HF 201	Orchard Mgt.	5
BI 103L	Gen. Animal Biol.		JM 315	Agr. Journalism	3
	Lab.	1	GL 342	Geology	3
HF 221	Landscape Gardening	5	MS	Military Training	1
SP 202	Applied Oral				
	Communication	3			
MS	Military Training	1			

JUNIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
ZY 300	Genetics	5	HF 308	Vegetable Crops	5
AN 350	Soil and Water		AY 304	General Soils	5
	Technology	5	AS 301	Agr. Marketing	5
BY 306	Fund. of Plant			Elective	3
	Physiology	5			
	Elective	3			

SENIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
HF 402	Storage, Packaging,		HF 406	Nut Culture	5
	and Marketing			Agr. Engineering	5
	Veg. Crops	3		Elective	5
HF 404	Fruit Growing	5		Electives	8
AS 401	Farm Management	5			
	Elective	5			

Total — 210 quarter hours

### Poultry Science

A program is offered with the option of science or business. In most cases students anticipating study beyond the B. S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

## Major in Poultry Science (PH)

## FRESHMAN YEAR

## First Quarter

MH 160	Algebra & Trig.	5
CH 103	Fund. of Chem. I	4
CH 103L	Fund. of Chem. Lab.	1
BI 101	Prin. of Biology	4
BI 101L	Prin. of Biology Lab.	1
MS	Military Training	1
PE	Physical Education	1

## Second Quarter

EH 101	English Composition	3
CH 104	Fund. of Chem. II	4
CH 104L	Fund. of Chem. Lab.	1
BI 102	Gen. Plant Biology	4
BI 102L	Gen. Plant Biology Lab.	1
MH 161	Anal. Geom. & Calc.	5
MS	Military Training	1

## Third Quarter

HY 101	World History	3
EH 102	English Composition	3
BI 103	Gen. Animal Biology	4
BI 103L	Gen. An. Biology Lab.	1
GL 101	Int. Geology I	5
MS	Military Training	1

## SOPHOMORE YEAR

HY 102	World History	3
EH 103	English Composition	3
PH 301	General Poultry	5
CH 207	Organic Chemistry	5
MS	Military Training	1
PE	Physical Education	1

HY 103	World History	3
SP 202	Applied Oral Commun.	3
AS 202	Agric. Economics	5
VM 311	General Bacteriology or	
VM 200	General Microbiology*	5
MS	Military Training	1
PE	Physical Education	1

AH 204	An. Biochemistry & Nutrition	5
PS 204	Physics or	
PS 205	Physics*	5
PG 211	Psychology I	5
MS	Military Training	1
	Elective	3

## JUNIOR YEAR

PH 302	Poultry Meat Prod.	3
EH 305	Business & Prof. Writing	3
AY 304	General Soils	5
PA 211	Intr. to Deductive Logic	3
	Elective	3

AS 361	Rural Sociology	5
ZY 300	Genetics	5
	Electives	8

AS 301	Agri. Marketing	5
SP 273	Group Prob. Solv. through Discussion	5
	Electives	8

## SENIOR YEAR

PH 405	Poultry Feeding	3
ZY 402	Economic Entomology or	
ZY 411	General Parasitology	5
	Electives	8

PH 408	Poultry Diseases & Parasites	5
AS 401	Farm Management	5
	Electives	8

PH 411	Poultry Marketing	3
PH 404	Poultry Management	5
	Electives	9

## Total — 210 quarter hours

\*Students choosing the science option should take VM 200 and PS 205 in order to further prepare for more work in these areas.

Of the 47 hours of electives 30 must be selected from the list of approved electives shown below.

## APPROVED ELECTIVES

## Business Option:

AS 304	Agric. Finance	3
AS 403	Agric. Prices	3
AS 405	Agric. Policy	3
AS 410	Agric. Bus. Mgt.	3
AN 353	Farm Bldg. Tech.	5
EC 211	Intr. Accounting	5
EC 212	Intr. Accounting	5
EC 314	Income Tax Acct.	5
EC 333	Salesmanship	3
FC 341	Business Law	5
EC 350	Labor Problems	5
FC 360	Money & Banking	5
EC 446	Business Cycles	5
EC 463	Corp. Finance	5
EC 465	Public Finance	5
PH 406	Incubation & Brooding	3
PH 407	Poultry Problems	3
PH 409	Poultry Problems	3
PH 410	Poultry Breeding	3
SP 270	Group Leadership	3
SY 204	Social Behavior	5
ZY 302	Vertebrate Embryology	5
AH 401	Swine Production	5
AH 402	Beef Cattle Production	5
DH 101	Man's Food	3

## Science Option:

BY 401	Biological Statistics	5
CH 105	General Chemistry	5
CH 208	Organic Chemistry	5
IE 301	Electronic Data Processing & Computer Programming	5
PH 406	Incubation & Brooding	3
PH 407	Poultry Problems	3
PH 409	Poultry Problems	3
PH 410	Poultry Breeding	3
PS 206	Intr. Physics	5
ZY 301	Comparative Anatomy	5
ZY 302	Vertebrate Embryology	5
ZY 409	Histology	5
ZY 424	Animal Physiology	5
ZY 429	Quantitative Genetics	5
FL 121-122	French	10
FL 131-132	Spanish	10
FL 151-152	German	10
FL 171-172	Russian	10

## Agricultural Business and Economics

The curriculum in Agricultural Business and Economics is for both those students who plan a career in business closely related to agriculture, and for those interested in the economics of agricultural production

and marketing and in public policies affecting agriculture. The curriculum is administered through a faculty advisory system wherein individual student programs of study are developed in accordance with individual student needs and interests. The need for broad training, rather than narrow specialization, is emphasized.

The curriculum not only combines both business and technical agricultural courses, but through selection of electives it provides an opportunity for students to emphasize training in agribusiness, in agricultural economics, in humanities, or in selected production fields. The curriculum leads to a degree of Bachelor of Science in Agricultural Business and Economics.

The demand for graduates who have both business and applied agricultural training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in teaching, research, sales, public relations, services, administration, and private employment in these fields. By properly selecting electives, students may prepare themselves to become (1) owners or managers of firms that produce, process, or market agricultural products; (2) teachers, research workers, or educational workers in the field; (3) public officials in the capacity of farm management or marketing specialists, commodity analysts, market news reporters, inspectors, credit analysts, etc.; or (4) employees of business firms that handle agricultural products or that service agricultural production and marketing firms.

### Curriculum in Agricultural Business and Economics (AS)

#### FRESHMAN YEAR

##### First Quarter

EH 101	English Comp.	3
MH 160	Algebra & Trig.	5
BI 101	Prin. of Biology	4
BI 101L	Biology Lab.	1
HY 101	World History	3
PE	Physical Education	1
MS	Military Training	1

##### Second Quarter

EH 102	English Comp.	3
MH 161	Anal. Geom. & Calc.	5
CH 103	Fund. Chem. I	4
CH 103L	Gen. Chem. Lab.	1
HY 102	World History	3
AS 102	Agr. Economics	3
LY 101	Use of Library	1
MS	Military Training	1

##### Third Quarter

EH 102	English Comp.	3
CH 104	Fund. Chem. II	4
CH 104L	Gen. Chem. Lab.	1
BI 102	Gen. Plant Biology	4
BI 102L	Biology Lab.	1
HY 103	World History	3
PE	Physical Education	1
MS	Military Training	1

#### SOPHOMORE YEAR

AH 204	Animal Biochem. & Nutrition	5
AS 202	Agr. Economics	5
BI 103	Gen. Animal Biol.	4
BI 103L	Biology Lab.	1
PE	Physical Education	1
MS	Military Training	1

EC 211	Intr. Accounting	5
PO 209	Intr. Am. Gov't	5
PS 204	Foundations of Physics	5
MS	Military Training	1

SP 202	App. Oral Comm.	3
EC 274	Bus. & Econ. Stat. I	5
EC 212	Intr. Accounting	5
DH 200	Fund. of Dairy or Poultry	5
PH 301	Gen. Poultry	5
MS	Military Training	1

#### JUNIOR YEAR

AH 303	Livestock Prod.	5
AY 307	Gen. Soils	5
EH 345	Bus. and Prof. Writing I	5
	Elective	3

AS 301	Agr. Marketing	5
AS 361	Rural Sociology	5
EC 341	Business Law	5
	Elective	3

AN 351	Agr. Mach. Tech. or*	5
EC 360	Money and Banking	5
	Electives	5

#### SENIOR YEAR

EC 446	Bus. Cycles	5
AS 410	Agr. Bus. Mgt.	3
	Electives	10

AY 401	Forage Prod'n. or Grain Prod'n.	5
FY 313	Farm Forestry	5
AS 403	Agr. Prices	5
	Electives	5

AS 401	Farm Management	5
AS 405	Agr. Policy	3
AS 490	Senior Seminar	1
	Electives	8

Total — 210 quarter hours

\*AN 350, AN 352, AN 353 or AN 354 may be substituted.

## RECOMMENDED ELECTIVES

Electives will be selected in consultation with faculty advisers based on student needs and interests. However, one elective course must be taken in each of two broad academic areas (humanities & fine arts, mathematics, and natural sciences).

Group 1			
AH 302 Feeds & Feeding	3	EC 452 Comp. Econ. Systems	5
AH 304 Meats	3	EC 463 Corporate Finance	5
AN 350 Soil & Water Tech.	5	EC 464 Investments	5
AN 351 Agr. Machinery Tech.	5	EC 465 Public Finance	5
AN 352 Tractor & Engine Tech.	5	EC 474 Bus. and Econ. Stat. II	5
AN 353 Farm Bldg. Tech.	5		
AN 354 Agr. Proces. Tech.	5	Group 3	
AY 404 Fiber & Oil Crops	5	AS 441 History & Philosophy of Extension	3
AY 406 Comm. Fert.	3	AS 462 Rur. Communities Around the World	3
AY 407 Soil Management	5	IE 501 Electronic Data Processing	5
HF 308 Veg. Crops	5	PA 210 Intr. To Philosophy	3
HF 401 Comm. Veg. Crops	3	PA 302 Ethics	3
		PG 211 Psychology I	3
Group 2		PG 330 Social Psychology	4
AS 302 Farm Records	3	PG 360 Fields of Prof. Psychology	5
AS 303 Agricultural Coop.	3	PO 407 Political Science	5
AS 304 Agr. Finance	3	SY 205 Cultural Anthropology	5
AS 305 Farm Appraisal	3	SY 311 Tech. & Soc. Chg.	3
AS 411 Econ. Development	3	SY 408 Indus. Socio.	5
AS 412 Economic Aspects of Water	5	ZY 204 Insects	3
AS 460 Intr. to Econometrics	3	ZY 206 Conservation	3
EC 333 Salesmanship	5	ZY 300 Genetics	5
EC 451 Intr. Microeconomics	5	ZY 402 Economic Entomology	5

## Agricultural Engineering

This technical field trains engineers in the agricultural areas. The curriculum includes courses basic to all types of engineering, courses with particular emphasis on engineering problems in agriculture, and general agricultural courses. The curriculum leads to a degree of Bachelor of Science in Agricultural Engineering. Students completing the curriculum have opportunities in many types of work where both engineering and agricultural knowledge are required.

The Agricultural Engineering curriculum is accredited by the Engineers' Council for Professional Development.

## Curriculum in Agricultural Engineering (AN)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 161 Anal. Geom. & Cal.	5	MH 162 Anal. Geom. & Cal.	5	MH 163 Anal. Geom. & Cal.	5
BI 101 Prin. of Biology	4	CH 103 Gen. Chem.	4	CH 104 Gen. Chem.	4
BI 101L Gen. Bio. Lab.	1	CH 103L Gen. Chem. Lab.	1	CH 104L Gen. Chem. Lab.	1
*EG 106 Graphical Methods	2	BI 102 Plant Bio. & Lab.	5	EH 102 English Comp.	3
EH 101 English Comp.	3	AN 101 Engr. & Agri.	1	AN 102 Agr. Engr. Prof.	1
LY 101 Use of Library	1	PE Physical Education	1	PE Physical Education	1
PE Physical Education	1	MS Military Training	1	MS Military Training	1
MS Military Training	1				

## SOPHOMORE YEAR

MH 264 Anal. Geom. & Cal.	5	PS 221 Gen. Physics II	4	MH 265 Diff. Equat.	5
PS 220 Gen. Physics I	4	ME 202 Engr. Mat. Science	3	ME 301 Thermodynamics I	4
BI 103 Animal Bio. & Lab.	5	ME 205 Appl. Mech. Stat.	4	ME 207 Strength of Mat.	3
IE 205 Comp. & Info. Syst.	3	EH 103 English Comp.	3	ME 321 Dynamics I	4
MS Military Training	1	HY 101 World History	3	PS 222 Gen. Physics III	4
		MS Military Training	1	MS Military Training	1

## JUNIOR YEAR

EE 262 Elec. Circuits	3	EE 273 Elec. Devices	3	EE 381 Elec. Magn. Devices	4
PS 320 Mod. Physics	3	AN 302 Mech. of Trac. Power	3	MH 362 Engr. Math I	3
AN 301 Mech. of Farm Mach.	3	AN 304 Drain. & Irrig.	3	AN 306 Elec. Systems	3
AN 303 Soil & Water Engr. I	4	AN 305 Agric. Proc. Engr.	3	HY 103 World History	3
AN 307 Structures Des. I	3	SP 202 App. Oral Commun.	3	Agric. Engr. Elective	3
ME 340 Fluid Mech.	3	HY 102 World History	3		

\*Students who have not had a course in drawing will need to take EG 102 before taking EG 106.



## SENIOR YEAR

## First Quarter

AS 202 Agric. Econ.	5
Engr. Electives	11

## Second Quarter

Agric. Engr.	
Elective	3
Engr. Electives	3
PA 202 Ethics & Soc.	5

## Third Quarter

Engr. Electives	3
Social & Hum.	
Elective	7
Agric. Electives	5

Total — 207 quarter hours

## ELECTIVES

Engineering electives and Agricultural Engineering electives will be selected in consultation with the faculty advisor and will be subject to the approval of the Department Head. A minimum of six hours of Agricultural Engineering electives will be taken by each student. The elective selection is to be based on the student's area of interest or specialization.

Three hours of Advanced ROTC may be substituted for SP 202 Applied Oral Communication. Requirements for agricultural electives may be met by taking 10 hours from the following: AY 455 Soil Physics, BY 401 Experimental Statistics for Biological Sciences, BY 306 Fundamentals of Plant Physiology, AS 401 Farm Management, ZY 402 Economic Entomology, AY 402 Soil Fertility, AH 204 Animal Biochemistry and Nutrition.

## APPROVED HUMANISTIC-SOCIAL ELECTIVES

## History and Government

HY 204 Hist. of the Modern World	3
HY 314 United States Colonial History	3
HY 315 International Organization	3
HY 322 The U.S. in World Affairs	3
HY 371 History of the West	3
HY 460 Great Leaders of History	5
HY 482 History of the South	5
HY Current Events	1
PO 209 American Government	5

## Philosophy and Religion

PA 301 Introduction to Philosophy	3
PA 302 Introduction to Ethics	3
PA 330 Philosophy of Religion	5
PA 308 Introduction to Logic	3
PA 440 American Philosophy	5

## Psychology

PG 211 General Psychology I	3
PG 311 Behavior of Man	3
PG 461 Industrial Psychology	5

## Literature

EH 208 Literature of the Western World	3
EH 320 An Introduction to Drama	3
EH 350 Shakespeare's Greatest Plays	3
EH 355 Masterpieces of World Literature	3
EH 365 Southern Literature	3
EH 381 The Literature of the Age of Reason	3
EH 385 The Impact of Science and Technology Upon Modern Literature	3
SP 310 Great American Speeches	3

## The Arts

AT 332 American Painting and Sculpture	3
AT 431 Contemporary Art	3
AR 360 Appreciation of Architecture	3
DR 313 Drama Appreciation I	3
DR 314 Drama Appreciation II	3
MU 373 Appreciation of Music	3
MU 374 Masterpiece of Music	3

## Economics and Geography

EC 206 Socio-Economic Foundations of Contemporary America	3
GY 301 Geo-Political Basis of World Powers	3
GY 405 Cultural Geography of the World	5
GY 407 World Resources & Their Utilization	5

## Sociology

SY 201 Introduction to Sociology	5
SY 204 Social Behavior	5
SY 307 The Court and Penal Administration	3
SY 311 Technology and Social Change	3
SY 403 Regional Sociology	5

## APPROVED HUMANISTIC-SOCIAL ELECTIVES

AN 401 Agricultural Power and Machinery Design	3
AN 403 Soil & Water Engineering II	3
AN 405 Elec. & Processing Systems Design	3
AN 407 Agricultural Structures Design II	3
AN 410 Design Problems	3
AN 411 Design Problems	3
ME 302 Thermodynamics II	3
ME 316 Strength of Materials II	4
ME 322 Dynamics II	4
ME 323 Dynamics of Machines	4
ME 341 Fluid Mechanics II	4
ME 427 Mechanical Vibrations	4
ME 421 Heat Transfer	4
ME 428 Air Conditioning and Refrigeration	4
ME 432 Automatic Controls	3
ME 439 Mechanical Engr. Design I	4
ME 440 Mechanical Engr. Design II	3
ME 443 Photoelastic Stress and Strain An.	3
CE 304 Theory of Structures I	5
CE 305 Water Supply and Disposal Systems	5
CE 308 Hydraulics	5
CE 380 Theory of Structures II	5
CE 402 Statically Indeterminate Structure	5
CE 404 Reinforced Concrete	5
CE 414 Structural Design	4
CE 418 Soil Mechanics	5
CE 423 Similitude in Engineering	3
CE 408 Engineering Foundations	3
CE 314 Photogeology for Engineers	5
CE 411 Flow in Open Channels	5
CE 412 Hydrology	5
IE 211 Engineering Statistics I	4
IE 320 Engineering Economy	5

## Biological Sciences (BI)

## Major in Botany

## FRESHMAN YEAR

## First Quarter

BI 101 Prin. of Biology	4
BI 101L Gen. Prin. Bio. Lab.	1
MH 160 Algebra & Trig.	5
EH 101 English Comp.	3
HY 101 World History	3
MS Military Training	1

## Second Quarter

BI 102 Gen. Pl. Biology	4
BI 102L Gen. Pl. Biology Lab.	1
MH 161 Anal. Geom. & Cal.	5
EH 102 English Comp.	3
HY 102 World History	3
LY 101 Use of Library	1
MS Military Training	1

## Third Quarter

BI 103 Gen. Animal Bio.	4
BI 103L Gen. Animal Bio. Lab.	1
CH 103 Fund. Chemistry I	4
CH 103L Gen. Chem. Lab.	1
EH 103 English Comp.	3
HY 103 World History	3
MS Military Training	1

## SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
CH 104	Fund. Chemistry II 4	CH	Org. Chem. Elective 5	CH	Chemistry Elective 5
CH 104L	Gen. Chem. Lab. 1	BY 309	Gen. Plant. Pathology 5	VM 200	Gen. Microbiology 5
ZY 300	Genetics 5	GL 101	Intr. Geology I 5		Elective 5
EC 200	Gen. Economics or	MS	Military Training 1	MS	Military Training 1
AS 202	Agr. Economics 5	PE	Physical Education 1	PE	Physical Education 1
MS	Military Training 1				
PE	Physical Education 1				

## JUNIOR YEAR

PS 205	Intr. Physics 5	PS 206	Intr. Physics 5	BY 306	Fund. Plant Physiology 5
SP 202	Appl. Oral Commun. 3	AY 304	General Soils 5	ZY 304	Gen. Entomology 5
PA 210	Intr. Philosophy 3	EH 253	English Lit. 3		Electives 8
	Elective 6		Elective 5		

## SENIOR YEAR

BY 413	Gen. Plant Ecology 5	BY 415	Plant Anatomy 5	BY 406	Systematic Botany 5
FL 121	Elem. French or	FL 122	Elem. French or		Electives 13
FL 151	Elem. German 5	FL 152	Elem. German 5		
	Electives 8		Electives 8		

## Total — 210 quarter hours

Students desiring to major in Botany will be assigned an adviser. A major will, during the sophomore year, with the assistance and approval of the adviser develop a plan of study for the junior and senior years from lists of approved elective courses. As approved by the Dean of Agriculture and the student's adviser, substitutions may be permitted to meet specific needs of individual students.

## Majors in Zoological Sciences

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of four options: zoology, entomology, fisheries, or wildlife, and degrees are offered in each option.

During the first two years all students take the same subjects which emphasize the basic sciences and background courses. Thereafter, it is possible to elect courses to fit specific needs of the student in his or her option. The program during the junior and senior years is developed under the guidance of a faculty adviser who works closely with the student. During this period the student may wish to work toward graduate school upon graduation. The faculty adviser assists the student in developing a program of study and with other academic and personal matters throughout his four years of training. Diversified career opportunities are excellent for well-trained persons in zoological sciences, and the opportunities increase as the level of training is raised.

At the bachelor's degree level, greatest demands are for research, management, survey, and regulatory work with state or federal agencies concerned with insects, fish, wildlife, or public health; for public relations and sales work with commercial companies; for technical assistants in research laboratories; for conservation and recreational work; and for private enterprises. At the graduate degree levels, opportunities are greatly enhanced, particularly for teaching, research, and extension at the university level; for research, development, and management with industry; for research with the Public Health Service, Fish and Wildlife Service, Entomology Research Division, United States Department of Agriculture, the Atomic Energy Commission, and other research organizations; and for employment in other areas.

## Zoological Sciences

Options: Entomology, Fisheries, Wildlife, Zoology

## FRESHMAN YEAR

## First Quarter

BI 101	Prin. of Biology	4
BI 101L	Gen. Prin. Biology Lab.	1
MH 160	Algebra & Trig.	5
AS 202	Agr. Economics	5
ZY 100	Zool. Orientation	0
MS	Military Training	1
PE	Physical Education	1

## Second Quarter

BI 102	Gen. Plant Biology	4
BI 102L	Gen. Plant Biology Lab.	1
MH 161	Anal. Geom. & Calc.	5
CH 103	Fund. Chemistry I	4
CH 103L	Chemistry Lab.	1
MS	Military Training	1
PE	Physical Education	1

## Third Quarter

BI 103	Gen. Animal Biology	4
BI 103L	Gen. Anim. Biology Lab.	1
MH 162	Anal. Geom. & Calc.	5
CH 104	Fund. Chemistry II	4
CH 104L	Chemistry Lab.	1
MS	Military Training	1
PE	Physical Education	1

## SOPHOMORE YEAR

ZY 300	Genetics	5
CH 207	Organic Chemistry	5
EH 101	English Comp.	3
HY 101	World History	3
MS	Military Training	1

ZY 303	Systematics & Evolution	5
CH 208	Organic Chemistry	5
EH 102	English Comp.	3
HY 102	World History	3
MS	Military Training	1

ZY 306	Prin. of Anim. Ecol.	5
PS 205	Intr. Physics	5
EH 103	English Comp.	3
HY 103	World History	3
MS	Military Training	1

## JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

## SENIOR YEAR

54 hours to be arranged in consultation with adviser.

## Total hours required — 210 quarter hours

In addition to the courses listed above all students majoring in the zoological sciences must take the following courses:

PS 206	Intr. Physics	5	ZY 301	Comparative Anat.	5	ZY 424	Animal Physiology	5
SP 202	App. Oral Comm.	5	ZY 304	Gen. Entomology	5	ZY 421	Vert. Zoology I or	5
VM 200	Microbiology	5	ZY 411	Parasitology	5	ZY 422	Vert. Zoology II	5

The remaining 70 hours will include a minimum of 12 hours of electives selected from the humanities and social science electives and a minimum of 35 hours of group electives shown in the following lists.

## GROUP ELECTIVES—ZOOLOGY AND ENTOMOLOGY

AH 204	An. Nutrition and Biochemistry	5	ZY 207	Birds	3
AH 406	Reproductive Physiology	5	ZY 210	Fish Culture	3
AY 304	Soils	5	ZY 302	Vertebrate Embryology	5
AY 401	Prin. Forage Production	5	ZY 308	Micrology	5
BY 306	Plant Physiology	5	ZY 310	Cell Biology	5
BY 309	Plant Pathology	5	ZY 401	Invertebrate Zoology	5
BY 401	Biological Statistics	5	ZY 402	Economic Entomology	5
BY 406	Systematic Botany	5	ZY 404	Medical Entomology	5
BY 411	Phycology	5	ZY 405	Forest Insects	5
BY 413	Plant Ecology	5	ZY 406	Bee Culture	3
BY 414	Plant Morphology	5	ZY 407	General Insect Morphology	5
BY 415	Developmental Plant Anatomy	5	ZY 409	Histology	5
CH 105	General Chemistry	3	ZY 410	Systematic Entomology	5
CH 105L	General Chemistry Laboratory	2	ZY 415	Limnology	5
CH 204	Analytical Chemistry	5	ZY 418, 419	Experimental Heredity	3, 3
CH 316	Physical Chemistry	5	ZY 420	Human Heredity	5
EH 304	Technical Writing	3	ZY 421	Vertebrate Zoology I	5
GL 101, 102, 103	Introductory and Historical Geology	5, 5, 5	ZY 422	Vertebrate Zoology II	5
MH 163	Geometry and Calculus	5	ZY 426	Principles of Game Management	5
MH 264	Analytic Geometry — Calculus	5	ZY 437	Fisheries Biology	3
MH 361	Differential Equations	5	ZY 442	Marine Invertebrate Zoology	9
PS 419	Scientific Instrumentation	3	ZY 443	Marine Vertebrate Zoology and Ichthyology	9
ZY 205	Wildlife Conservation	3	ZY 444	Marine Fisheries Biology	6
ZY 206	Conservation in U. S.	3	ZY 450	Zoogeography of the Vertebrate	5

## GROUP ELECTIVES—FISHERIES AND WILDLIFE

AS 412	Economic Aspects of Water Resource Management	5	GL 101, 102, 103	Introductory Geology	5, 5, 5
AY 307	General Soils	5	PS 419	Scientific Instrumentation	3
AY 401	Prin. of Forage Production	5	ZY 205	Wildlife Conservation	3
BY 306	Fundamentals of Plant Physiology	5	ZY 206	Conservation in U. S.	3
BY 401	Biological Statistics	5	ZY 207	Birds	3
BY 406	Systematic Botany	5	ZY 210	Fish Culture	3
BY 410	Aquatic Plants	5	ZY 310	Cell Biology	5
BY 411	Phycology	5	ZY 326	Wildlife Biology	5
BY 413	Plant Ecology	5	ZY 401	Invertebrate Zoology	5
BY 414	Plant Morphology	5	ZY 410	Systematic Entomology	5
FY 301	Silviculture	5	ZY 415	Limnology	5
FY 303	Forest Recreation	3	ZY 416	Biological Productivity and Water Quality	3
FY 415	Range Management	2	ZY 421	Vertebrate Zoology I	5

ZY 422 Vertebrate Zoology II	5	ZY 439 Aquatic Ecology	5
ZY 426 Principles of Game Management	5	ZY 442 Marine Invertebrate Zoology	9
ZY 427 Wildlife Habitat Analysis	3	ZY 443 Marine Vertebrate Zoology and Ichthyology	9
ZY 428 Hatchery Management	5	ZY 444 Marine Fisheries Biology	6
ZY 435 Marine Biology	3	ZY 445 Fish Parasites	3
ZY 436 Mgt. of Small Impoundments	3	ZY 446 Fish Diseases	3
ZY 437 Fisheries Biology	3		
ZY 438 General Ichthyology	5		

#### HUMANITIES AND SOCIAL SCIENCES ELECTIVES FOR ZOOLOGICAL SCIENCES

EH 214 Medical Vocabulary	3	JM 315 Agr. Journalism	3
EH 253, 254, 255 Survey of English Literature	3, 3, 3	JM 322 Feature Writing	5
EH 301 Advanced Composition	5	JM 421 Photo Journalism	5
EH 302, 303 Creative Writing	3, 3	PA 202 Ethics and Society	5
EH 365, 366, 367 American Literature	5, 5, 5	PA 210 Introduction to Philosophy	3
FL 121, 122, 123 Elementary & Intermediate French	5, 5, 5	PA 211 Introduction to Deductive Logic	3
FL 131, 132, 133 Elementary & Intermediate Spanish	5, 5, 5	PA 212 Introduction to Inductive Logic	3
FL 151, 152, 153 Elementary & Intermediate German	5, 5, 5	PA 400 Philosophy on Science	5
GY 102 Principles of Geography	5	PG 211, 212 Psychology I and II	3, 3
GY 103 Economic Geography	5	PG 455 Animal Behavior	4
HY 322 The U. S. In World Affairs	3	PO 206 U. S. Government	5
HY 381 History of Alabama	5	PO 209 National Government	5
		PO 312 Introduction to Comparative Government	5
		SY 201 Introduction to Sociology	5
		SY 203 Cultural Anthropology	5

## Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors either in Botanical or Zoological Sciences, who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences major and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisor by the end of their sophomore year if possible. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program.

In addition to the specific requirements, including group electives required for the B.S. in Zoological Sciences or Botany, these students must also include the following courses in their curriculum:

EH 253, 254 Literature in English	3, 3
EH 365 Survey of American Literature	5
FED 213 Human Growth and Development	5
FED 214 Educational Psychology	5
FED 200 Fundamentals of Education	4
FED 300 Principles and Practices in Education	4
FED 490 Evaluation in Education	3
SED 405K Teaching in Secondary School - Science	3
SED 410K Program in Secondary School - Science	3
SED 425K Student Teaching - Science	15

Any of the above courses may be used as free electives toward the degree in Zoological Sciences or Botany and EH 253, EH 254, EH 365, FED 213 and FED 214 may be used as needed as humanistic-social electives. Students in the Zoological Sciences seeking to fulfill the requirements for teaching certification must elect at least 15 hours in botanical sciences from among the following courses: BY 306, BY 406, BY 411, BY 413, BY 414, BY 415. Students majoring in botany who want to earn a teaching certification must include at least 10 hours of

electives in the Zoological Sciences from ZY 303, ZY 301, ZY 401, ZY 411, ZY 421, and ZY 422.

## Food Science

The Food Science curriculum is designed for those who are interested in positions in the rapidly expanding food industry. The curriculum is administered through a faculty advisory system wherein a program of study may be developed in accordance with the needs and interests of the individual student. In this manner, a student may take a general course or may specialize in a commodity area such as dairy products, meats or fruits and vegetables. He may elect a business option with supporting courses in economics and business or he may elect a sciences option.

### Curriculum in Food Science (FS)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
CH 103 Fund. of Chem. —4	CH 104 Fund. of Chem. —4	CH 105 Fund. of Chem. —3
CH 103L Chemistry Lab. —1	CH 104L Chemistry Lab. —1	CH 105L Chemistry Lab. —2
EH 101 English Comp. —3	EH 102 English Comp. —3	EH 103 English Comp. —3
HY 101 World History —3	HY 102 World History —3	HY 103 World History —3
MH 160 Algebra & Trig. —5	MH 161 Anal. Geom. & Calc. —5	DH 101 Man's Foods —3
MS Military Training —1	LY 101 Library Science —1	SP 202 Applied Oral Comm. —3
	MS Military Training —1	MS Military Training —1
SOPHOMORE YEAR		
BI 101 Prin. of Biology —4	BI 102 Gen. Plant Biology —4	BI 103 Gen. Animal Bio. —4
BI 101 L Biology Lab. —1	BI 102L Plant Biology Lab. —1	BI 103L Animal Biol. Lab. —1
CH 204 Anal. Chem. —3	CH 207 Organic Chem. —5	CH 208 Organic Chem. —5
CH 204L Anal. Chem. Lab. —2	PS 206 Intr. Physics —5	VM 200 Gen. Micro. —5
PS 205 Intr. Physics —5	MS Military Training —1	MS Military Training —1
MS Military Training —1	PE Physical Education —1	PE Physical Education —1
PE Physical Education —1		
JUNIOR YEAR		
AH 204 Animal Biochem. or	AS 202 Agri. Economics or	EH 304 Bus. & Prof. Writ. —5
HE 312 Nutri. Biochem. —5	EC 200 Gen. Economics —5	HF 342 Indust. Food Equip.
HF 340 Indust. Food Pres.	HF 341 Indust. Food Equip.	& Processing II —5
Technology —5	& Processing I —5	Electives —8
Electives —8	Electives —8	
SENIOR YEAR		
DH 411 Food Plant Sani. —5	HF 343 Food Analysis &	DH 410 Food Microbiology —5
IE 320 Engineering Econ. —5	Qual. Control —5	DH 412 Food Science Sem. —1
Electives —10	Electives —12	Electives —12

Total — 210 quarter hours

## Forestry

Two curricula are offered in forestry, one in forest management and the other in wood technology. The former leads to the degree Bachelor of Science in Forestry while the other leads to the degree Bachelor of Science in Wood Technology. The Department also offers an honors program which leads to the degree Bachelor of Science in Forestry (Honors Program) and a recreation option in the forest management curriculum.

Training in forest management and administration prepares the student as a land manager. He acquires professional knowledge and skills relating to efficient production of wood as a raw material. He studies policies, techniques and procedures whereby land may be managed for related products and services including water, wildlife and

recreation. There is a strong demand for foresters in private industry in the South. State and Federal agencies as well as consulting foresters employ a large number of graduates. The graduate may expect his initial assignments to include land line surveying, timber cruising, timber marking and land and timber purchasing. After experience is gained the graduate will assume more responsibility for land management plans and policies in his capacity as a land manager.

The recreation option for the forest management curriculum is designed to prepare foresters to cope with the special problems arising from the increased use of forest land for recreational purposes. Some attention is given to the sociological and psychological aspects of these activities and the harmonious inclusion of recreation into the overall land management program.

Wood technology is the science of making the most efficient use of the products of the tree. This includes the development of new products as well as more efficient production of standard products. The wood technologist must understand the physics and chemistry of wood as well as its anatomy and structure and must be familiar with various wood products and the methods for manufacturing them. The curriculum is sufficiently flexible that the student may specialize in chemistry, structural design, industrial management or in other fields of his choice by proper selection of his minors in these fields. The wood technologist finds employment with wood manufacturing industries and their suppliers as well as with private and public organizations which carry on research and product development for industry.

The Department of Forestry is accredited by the Society of American Foresters.

### Curriculum in Forest Management (FY)

#### FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp. — 3	EH 102	English Comp. — 3	EH 103	English Comp. — 3
HY 101	World History — 3	HY 102	World History — 3	HY 103	World History — 3
MH 160	Algebra & Trig. — 5	MH 161	Anal. Geom. & Cal. — 5	MH 162	Anal. Geom. & Cal. — 5
BI 101	Prin. of Biol. — 4	BI 102	Gen. Plant Biol. — 4	BI 103	Gen. Anim. Biol. — 4
BI 101L	Prin. of Biol. Lab. — 1	BI 102L	Gen. Plant Biol. Lab. — 1	BI 103L	Gen. An. Biol. Lab. — 1
FY 105	For. Convocation* — 0	MS	Military Training — 1	MS	Military Training — 1
MS	Military Training — 1	PE	Physical Education — 1	PE	Physical Education — 1
PE	Physical Education — 1				

#### SOPHOMORE YEAR

PS 205	Intr. Physics — 5	CH 103	Fund. of Chem. I — 4	CH 104	Fund. of Chem. II — 4
GL 102	Intr. Geology II — 5	CH 103L	Gen. Chem. Lab. — 1	CH 104L	Gen. Chem. Lab. — 1
EC 215	Fund. Cost Acctg. — 5	ZY 300	Genetics — 5	PG 211	Psychology I — 3
MS	Military Training — 1	FY 104	For. Cartography — 2	EH 304	Technical Writing — 3
		SP 202	Appl. Oral Comm. — 3	CE 201	Surveying I — 5
		MS	Military Training — 1	MS	Military Training — 1

#### JUNIOR YEAR

FY 201	Dendrology — 5	AY 305	Gen. Soils — 5	FY 207	Silvics II — 5
FY 204	For. Mensuration — 5	FY 203	Silvics I — 5	ZY 305	For. Entomology — 3
AS 202	Agric. Economics — 5	FY 309	Sampling — 3	FY 310	Adv. Mensur. — 3
IE 204	Comp. Program — 3	FY 437	For. Econ. I — 3	FY 438	For. Econ. II — 3
			Elective — 3	BY 310	For. Pathology — 3

#### SUMMER CAMP

FY 390	Field Mensuration — 3
FY 391	For. Engineering — 3
FY 397	For. Regeneration — 3
FY 303	For. Recreation — 3
FY 417	Photogrammetry — 5

\*This course will be taken in all except Summer Quarters.



**SENIOR YEAR****First Quarter**

FY 420	Silviculture	5
FY 205	Wood Ident.	3
FY 415	Range Mgt.	2
FY 408	Logging	3
	Elective	5

**Second Quarter**

FY 436	For. Watershed Mgt.	3
FY 302	For. Fire Control	3
ZY 425	For. Wildlife Mgt.	3
FY 435	For. Prod. Mktg.	3
	Elective	5

**Third Quarter**

FY 407	For. Management	5
FY 434	For. Policy & Law	5
FY 396	For. Site Eval.	2
	Elective	7

Total — 228 quarter hours

**Recreation Option**

Freshman and Sophomore Years Same As In Forest Management Curriculum

**JUNIOR YEAR****Fall**

FY 201	Dendrology	5
FY 204	For. Mensuration	5
AS 202	Agr. Economics	5
IE 204	Comp. Prog.	3

**Winter**

AY 305	Gen. Soils	5
FY 203	Silvics I	5
FY 309	Sampling	3
FY 437	For. Econ. I	3
	Elective	3

**Spring**

BY 310	For. Pathology	3
FY 207	Silvics II	5
FY 438	For. Econ. II	3
FY 460	Wildland Rec.	3
	Phil. & Pol.	3
PG 490	Sp. Prob. Psy:	
	(Recr. Psy.)	3

**SUMMER CAMP**

FY 391	Forest Engineering	3
FY 303	Forest Recreation	3
HF 327	Landscape	
	Engineering	3
FY 461	Recr. Land Classif.	3
FY 417	Photogrammetry	5

**SENIOR YEAR**

FY 420	Silviculture	5
FY 415	Range Mgmt.	2
ZY 447	Mgmt. of Streams	
	& Lg. Impdmts.	3
	Electives	8

FY 436	Watershed Mgmt.	3
FY 302	For. Fire Cont.	
	& Use	3
ZY 425	For. Wildlife Mgmt.	3
SY 204	Social Behavior	5
	Elective	3

FY 407	For. Mgmt.	5
FY 434	For. Pol. & Law	5
FY 469	Rec. Site Mgmt.	3
	Elective	6

**Honors Program In Forestry****JUNIOR YEAR****Second Quarter**

FY 201	Dendrology	5
FY 204	For. Mensuration	5
IE 204	Computer Prog.	3
	Elective	5

AY 305	General Soils	5
FY 203	Silvics I	5
FY 309	Sampling	3
FY 437	For. Economics I	3
	Elective	3

**Third Quarter**

FY 207	Silvics	5
FY 438	For. Economics II	3
FY 421	For. Research	
	Meth.*	3
	Elective	6

**SENIOR YEAR**

FY 420	Silviculture	5
	Elective	13

	Elective	18
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FY 407	For. Management	5
FY 480	Senior Thesis	5
FY 490	Seminar in For.	1
	Elective	6

Total — 210 quarter hours

\*Any 3 or 5 hour course in statistics may be substituted for FY 421.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty advisor, so as to develop a distinct program leading to a predetermined goal.

**Curriculum in Wood Technology (WT)****FRESHMAN YEAR****Second Quarter**

EH 101	English Comp.	3
HY 101	World History	3
CH 103	Fund. Chem. I	4
CH 103L	Gen. Chem. Lab.	1
MH 160	Algebra & Trig.	5
FY 105	For. Convocation*	0
MS	Military Training	1
PE	Physical Education	1

EH 102	English Comp.	3
HY 102	World History	3
CH 104	Fund. Chem. II	4
CH 104L	Gen. Chem. Lab.	1
MH 161	Anal. Geom. & Cal.	5
MS	Military Training	1
PE	Physical Education	1

**Third Quarter**

EH 103	English Comp.	3
HY 103	World History	3
CH 105	Gen. Chemistry	3
CH 105L	Gen. Chem. Lab.	2
MH 162	Anal. Geom. Cal.	5
MS	Military Training	1
PE	Physical Education	1

\*This course to be taken in all except summer quarters.

## SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101 Prin. of Biol.	4	BI 102 Gen. Plant Biol.	4	BI 103 Gen. Anim. Biol.	4
BI 101L Prin. of Biol. Lab.	1	BI 102L Gen. Plant Biol. Lab.	1	BI 103L Gen. Biol. Lab.	1
PS 205 Intr. Physics	5	PS 206 Intr. Physics	5	FY 206 Wood Measure**	3
MH 163 Anal. Geom. & Cal.	5	AH 204 An. Biochem. & Nut.	5	EG 102 Eng. Drawing	2
MS Military Training	1	MS Military Training	1	FY 205 Wood Ident. & Uses	3
				EH 304 Technical Writing	3
				MS Military Training	1

## JUNIOR YEAR

EC 200 Gen. Economics	5	FY 432 Seasoning & Preserv.**	5	PG 211 Psychology I	3
FY 201 Dendrology	5	FY 421 For. Research Meth.***	5	FY 433 Seas. & Preserv. Lab.	2
FY 311 Wood Anatomy**	5	Elective	10	Elective	12
SP 202 Appl. Oral Comm.	5				

## SENIOR YEAR

FY 330 For. Products**	5	FY 425 Wood Glu. & Lam.**	5	FY 431 Mech. Prop. of Wood**	5
Elective	13	Elective	13	Elective	13

## Total — 210 quarter hours

Sufficient latitude is allowed that the student may plan his elective work with his adviser to fulfill his personal objectives while in college. One minor, consisting of 30 hours in the area of Mathematics, Chemistry or Engineering, is required. In addition, 10 hours in computer programming and 10 hours in statistics, including laboratory are to be selected from the electives. From the remaining elective hours, 10 are to be selected with the advisor in the general area of humanities. A student may always substitute a more intensive group of courses for one or more of the required courses, providing the same breadth of coverage is maintained.

As a part of the requirement for the degree with a major in wood technology the student must complete a minimum of three weeks of supervised tours of forest products industries. A satisfactory report on these tours is to be submitted to the department head by the beginning of the final quarter prior to graduation.

\*\*Alternate year offering.

\*\*\*Any 3 or 5 hour course in statistics may be substituted for FY 421.

## Landscape and Ornamental Horticulture

A blending of art, science and technology, Landscape and Ornamental Horticulture is a Life Science concerned with plants for personal enrichment and well-being. The professional Ornamentalist combines many diverse talents to suit his interests and ambitions.

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas — Landscape Design, Florist Crop Production, Nursery Crop Production and Retail Flower Shop Management. By proper selection of electives, students may prepare for careers in research, teaching or extension activities; as owners and managers of floral or woody ornamental production units and of retail outlets for floral and woody ornamental products; landscape designing; and managing recreational gardens and other areas.

Degree candidates are encouraged to have three months, or an equivalent of three months, practical experience in industry to be arranged by the student's major professor prior to graduation.

### Curriculum in Landscape and Ornamental Horticulture (OH)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101 Prin. Biology	4	BI 102L Gen. Plant Biology Lab.	1	CH 104 Fund. Chem. II	4
BI 101L Prin. Biology Lab.	1	CH 103L Gen. Chem. Lab.	1	CH 104L Gen. Chem. Lab.	1
EH 101 English Comp.	3	CH 103 Fund. Chem. I	4	EH 103 English Comp.	3
HF 101 Intr. Hort.	1	EH 102 English Comp.	3	HY 102 World History	3
MH 160 Alg. & Trig.	5	HY 101 World History	3	MH 161 Anal. Geom. & Cal.	5
MS Military Training	1	MS Military Training	1	MS Military Training	1
PE Physical Education	1	PE Physical Education	1	PE Physical Education	1

## SOPHOMORE YEAR

## First Quarter

BI 103	Gen. An. Biology	4
BI 103L	An. Biology Lab.	1
HF 221	Landscape Gard.	5
HY 103	World History	3
SP 202	Applied Oral Comm.	3
MS	Military Training	1

## Second Quarter

AS 202	Agr. Econ.	5
PA 210	Intr. Philosophy	3
PG 211	Psychology I	3
MS	Military Training	1
	Electives*	5

## Third Quarter

CH 207	Organic Chem.	5
HF 224	Plant Prop.	5
MS	Military Training	1
	Electives	5

## JUNIOR YEAR

BY 306	Plant Phys.	5
HF 323	Glasc. Constr. & Mgt.	3
	Electives	8

AY 304	Gen. Soils	5
BY 309	Plant Pathology	5
	Electives	8

EH 301	Adv. Comp.	5
	Electives	13

## SENIOR YEAR

ZY 402	Econ. Ent.	5
	Electives	15

HF 426	Minor Problems	5
	Electives	13

BI 406	System. Botany	5
AY 402	Soil Fertility	5
	Electives	8

Total - 210 quarter hours

\*This curriculum consists of four areas of study: Retail Flower Shop Management, Florist Crop Production, Nursery Crop Production and Landscape Design. Electives are provided in the Sophomore, Junior and Senior year to prepare a student in one of these areas and are to be selected at the consent of the student's advisor and with the approval of the Dean of Agriculture.

## RECOMMENDED ELECTIVES IN LANDSCAPE AND ORNAMENTAL HORTICULTURE

## Approved Electives from the

## Humanities and Social Sciences:

EH 185	Classical Literature	5
EH 253	Survey of English Literature	3
EH 285	Literature of the Western World	3
EH 302	Creative Writing	3
EH 365-366	Survey of American Literature	5-5
EH 377	The European Novel	5
EH 431-432	Shakespeare	5-5
FL 121	Elementary French	5
FL 122	Elementary French	5
FL 131	Elementary Spanish	5
FL 132	Elementary Spanish	5
FL 151	Elementary German	5
FL 152	Elementary German	5
FL 171	Elementary Russian	5
GY 201	Weather and Climate	5
GY 404	Physical Geography of the World	5
HY 201	History of U. S.	5
HY 202	History of U. S.	5
MU 371	Intr. to Music	3
PA 202	Ethics and Society	5
PA 210	Intr. to Philosophy	3
PA 211	Intr. to Deductive Logic	3
PA 212	Intr. to Inductive Logic	3
PA 310	Eastern Religious Thought	3
PA 315	Western Religious Thought	3
PA 401	The Philosophy of Communism	5
PG 211	Psychology I	3
PG 212	Psychology II	3
PO 206	U.S. Government	5
SY 201	Intr. to Sociology	5
SY 203	Cultural Anthropology	5

## Approved Group Electives:

AH 418	Biochemistry	5
AN 350	Soil and Water Technology	5
AR 110	Design Fundamentals	5
AR 111	Design Fundamentals	5
AR 360	Appreciation of Architecture	3
AR 370	Spaces for Living	3
AS 361	Agricultural Marketing	5
AS 410	Agricultural Business Management	3
AT 105	Drawing I	5
AT 106	Drawing II	5
AT 113	Perspective	3
AY 405	Turf and Its Management	3
AY 406	Commercial Fertilizers	3
BY 401	Biological Statistics	5
BY 406	Systematic Botany	5
BY 413	General Plant Ecology	5
CE 201	Surveying I	5
CH 204	Analytical Chemistry	5
CH 207	Organic Chemistry	5
CH 208	Organic Chemistry	5
EC 211-12	Intr. Accounting	5-5
EC 341	Business Law	5
EC 333	Salesmanship	3
EH 505	Bus. and Professional Writing II	3
GL 101-2	Intr. Geology	5-5
HF 201	Orchard Management	5
HF 225	Flower Arranging	3
HF 308	Vegetable Crops	5
HF 325	Landscape Planning of Home Grounds	5
HF 326	Landscape Planning of Public Grounds	5
HF 421	Care & Maintenance of Orn. Plants	5
HF 422	Fund. of Floricultural Crop. Prod.	5
HF 423	Fund. of Nursery Management	5
HF 424	Planting Design	5
HF 425	Flower Shop Management	5
HF 427-8	Minor Problems	5-5
HF 429	Adv. Plant Propagation	5
HF 430	Marketing Hort. Spec. Products	5
HF 431	Adv. Landscape Gardening	5
HF 432	Controlled Plant Growth	5
JM 315	Ag. Journalism	3
MH 162-3	Analytic Geometry & Calculus	5-5
PS 205	Intr. Physics	5
PS 206	Intr. Physics	5
VM 200	General Microbiology	5
ZY 300	Genetics	5

# School of Architecture and Fine Arts

J. INGRAHAM CLARK, *Dean*

**T**HE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Technology, Music, and Theatre. Undergraduate degree courses are offered in Architecture, Fine Arts, Visual Arts, Theatre, Music, Interior Design, and Industrial Design. In addition graduate degree courses are offered in Fine Arts and Building Technology. The Departments of Theatre and Music offer sound basic training courses in these fields for students wishing to elect a minor or major concentration in them.

The School of Architecture and Fine Arts, in cooperation with the office of the Vice President for Extension, is developing continuing education and extension programs.

A continuing education seminar entitled "Introduction to Local Planning" is now being offered to civic leaders, community leaders, and to municipal employees of Alabama municipalities. It is believed that such persons completing the course will recognize the need for establishing adequate planning for their communities and municipalities.

## Department of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the degrees Bachelor of Architecture, Bachelor of Interior Design and Bachelor of Industrial Design.

### *Admissions*

**Tests.** In addition to meeting the requirements for admission to the University all prospective students will be required to make a satisfactory score on the Architectural School Aptitude Test which is given by the Educational Testing Service, P.O. Box 592, Princeton, New Jersey 98540. Tests are given on certain dates at the Auburn Campus as well as at other university and college campuses throughout the United States. Persons wishing to take the test should correspond directly with the Educational Testing Service.

### *Acceptance*

Acceptance for admission to professional curricula in architecture, industrial design, and interior design in the School of Architecture will be determined by the Admissions Committee in the Department of Architecture on the basis of an evaluation of the candidate's test scores and academic records.

## Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at a level not higher than first quarter, second year. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Design Committee. The Committee will determine the level at which the student will enter the Design Sequence.

New students may enter the department any quarter. Transfer students with advanced credit may complete their first year requirements by taking advantage of the Summer session which combines AT 105 and AR 110 and 111.

## Architecture

The Curriculum in Architecture prepares the student to take his place as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, the architect today must accept a concern for the improvement of the physical environment and assume the leadership in evolving effective procedures toward this end. Therefore, in an area of broad technological advancement, the architect must bring to his work technical knowledge, social insight, creative imagination, and individual integrity.

The Department of Architecture is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. Training at Auburn University prepares the student for the office experience and the examination required by the registration laws for the practice of architecture in Alabama as well as for examination by the National Council of Architectural Registration Boards. The cooperative education program is also offered. For more information refer to page 46.

Simulated State Board examinations will be given during the fifth year to prepare Architecture students for this test after graduation.

### Curriculum in Architecture (AR)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
AR 110 Design Fundamentals .5	AR 111 Design Fundamentals .5	AT 105 Basic Drawing .5
EH 101 English Comp. .3	EH 102 English Comp. .3	EH 103 English Comp. .3
MH 161 Anal. Geom. & Calc. .5	MH 162 Anal. Geom. & Calc. .5	MH 163 Anal. Geom. & Calc. .5
HY 101 World History .3	HY 102 World History .3	HY 103 World History .3
MS Military Training .1	MS Military Training .1	MS Military Training .1
TH 101 Intr. to the Arts .1	TH 102 Intr. to the Arts .1	TH 103 Intr. to the Arts .1
SECOND YEAR		
AR 201 Architectural Design .5	AR 202 Architectural Design .5	AR 203 Architectural Design .5
PS 205 Physics .5	BT 106 Math. & Constr. .5	BT 220 Mech. of Structures .5
Gen. Elective .5	PS 206 Physics .5	Gen. Elective .5
MS Military Training .1	MS Military Training .1	MS Military Training .1
PE Physical Education .1	PE Physical Education .1	PE Physical Education .1
THIRD YEAR		
AR 301 Architectural Design .5	AR 302 Architectural Design .5	AR 303 Architectural Design .5
BT 311 Structures I .3	BT 312 Structures II .3	BT 313 Structure III .3
AR 361 Hist. & Theory of Architecture .3	AR 362 Hist. & Theory of Architecture .3	AR 363 Hist. & Theory of Architecture .3
PG 211 Psychology .3	SY 201 Sociology .5	EC 206 Socio-Economic Foundations .3
Gen. Elective .3	Gen. Elective .3	Gen. Elective .3

FOURTH YEAR		
First Quarter	Second Quarter	Third Quarter
AR 401 Architectural Design .5	AR 402 Architectural Design .5	AR 403 Architectural Design .5
AR 461 Hist. & Theory of Architecture .3	BT 411 Structures IV .3	BT 413 Structures VI .3
AR 474 Planning .3	BT 412 Structures V .3	AR 463 Hist. & Theory of Architecture .3
SY 405 Sociology .5	AR 462 Hist. & Theory of Architecture .3	BT 453 Bldg. Equipment .3
Gen. Elective .3	BT 452 Bldg. Equipment .3	Gen. Elective .3
FIFTH YEAR		
AR 465 Arch. Design .5	AR 466 Arch. Design .5	AR 467 Arch. Design .7
AR 471 Prof. Prac. .3	AR 472 Prof. Prac. .3	Seminar .5
Group Elective .5	AR 499 Design Research .2	Group Elective .5
Seminar .3	Group Elective .5	
Gen. Elective .3	Gen. Elective .3	

### Total — 265 quarter hours

Five-hour elective courses will include either three courses in advanced structures or electives chosen from the group electives in Art, Economics, English, Foreign Languages, History, Philosophy, Psychology, Sociology, and Speech.

Six hours of Advanced ROTC may be substituted for six hours of general elective credit.

Seminars will be chosen from the following list:

AR 476 Seminar in Contemporary Concepts	5
AR 477 Seminar in Historical Problems	5
AR 460 The Architect and Society	3
AR 475 Seminar in Urban Design	3
AR 479 Seminar in Architecture Literature	2
AR 435 Art and Architecture Seminar	3

## Honors Program in Architecture

Beginning in the fourth year of the curriculum in Architecture, superior students capable of independent study may be permitted, on recommendation of the Committee on Honors Program, to pursue an approved sequence of study designed to develop a field of concentration. Each student shall submit a plan of study for approval before commencing the work. The student may earn a maximum of 15 hours of credit in independent study, a special project, or in research. After approval students shall enroll in AR 495, Honors Program, for up to 5 hours credit in any one quarter, and pursue the independent study under the supervision of an assigned faculty member.

## Interior Design

The curriculum in Interior Design seeks to prepare the student to take his place as a professional specialist in the design of interior space. As such, he expects to assume a responsible role among those who shape physical environment. His primary interest in the development of interiors is concerned with the social, historical and technical implications of these aspects of space, surface and material which distinguish his work. His training will enable him to develop a practice as a private consultant, as a designer of furniture and textiles, and as a valuable associate of the environmental design team.

### Curriculum in Interior Design (ID)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
AR 111 Design Fundamentals 5	AT 105 Drawing I .5	AR 110 Design Fundamentals 5
EH 101 English Comp. .3	EH 102 English Comp. .3	EH 103 English Comp. .3
HY 101 World History .3	HY 102 World History .3	HY 103 World History .3
TH 101 Intr. to the Arts .3	MH 159 Pre-Cal. Math .5	MH 161 Anal. Geom. & Cal. .5
PE Physical Education .1	PE Physical Education .1	PE Physical Education .1
MS Military Training .1	MS Military Training .1	MS Military Training .1



**SECOND YEAR****First Quarter**

AR 201	Architectural Design	5
AR 361	Hist. & Theory of Architecture	3
AR 215	Elements of I.D.	3
PG 211	Psychology	3
MS	Military Training	1
	Gen. Elective	3

**Second Quarter**

AR 202	Architectural Design	5
AR 362	Hist. & Theory of Architecture	3
AR 216	Elements of I.D.	3
MS	Military Training	1
SY 201	Intr. Sociology	5

**Third Quarter**

AR 203	Architectural Design	5
AR 363	Hist. & Theory of Architecture	3
HE 333	Lighting Equipment	3
EC 200	Gen. Economics	5
MS	Military Training	1

**THIRD YEAR**

AR 305	Interior Design	5
AR 365	Period Interiors	5
HE 415	History of Textiles	5
	Gen. Elective	3

AR 306	Interior Design	5
AR 366	Period Interiors	5
FL	Foreign Language	5
	Gen. Elective	3

AR 307	Interior Design	5
AR 367	Contemporary Interiors	3
EC 331	Marketing	5
FL	Foreign Language	5

**FOURTH YEAR**

AR 405	Interior Design	5
AR 441	Professional Prac.	3
HE 345	Creative Crafts	3
	Natural Science	
	Elective	5

AR 406	Interior Design	5
AR 408	Interior Design Res.	2
AT 338	Art History I	5
	Natural Science	
	Elective	5

AR 407	Interior Design	7
	(thesis)	
AT 339	Art History II	5
	Group Elective	5

**Total — 208 quarter hours**

Two months of practical experience with a professional interior designer is required between the 3rd or 4th year.

**Industrial Design**

Industrial Design is concerned primarily with the relation of products and systems to those who use them, and encompasses such areas as: product design, package design, transportation design, and exhibition design.

The professional industrial designer works as a team member of the development of almost any object of everyday use including consumer goods and capital goods. He studies the total impact of a probable object upon its user, and creates from this viewpoint a useful product which improves the human environment.

Industrial Design is thus an integrating activity in which different abstract data and points of view from technology, art, science and the humanities are transformed and physically embodied into the form, structure, and functions of a machine-produced object for practical and aesthetic use.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. Graduates will qualify for the positions in Industrial Design consultant offices and in various industries.

The cooperative education program is offered. For more information refer to page 46.

**Curriculum in Industrial Design (IN)****FIRST YEAR****First Quarter**

AR 110	Design Fundamentals	5
EH 101	English Comp.	3
HY 101	History	3
MH 159	Pre-Cal. Math	5
IL 101	Woodworking	1
MS 101	Military Science	1
PE	Physical Education	1

**Second Quarter**

AT 105	Drawing I	5
EH 102	English Comp.	3
HY 102	History	3
MH 161	Anal. Geom. & Cal.	5
IL 102	Welding Science	1
MS 102	Military Training	1
PE	Physical Education	1

**Third Quarter**

AR 111	Design Fundamentals	5
EH 103	English Comp.	3
HY 103	History	3
EG 102	Engr. Drawing I	2
TH 103	Intr. to Arts	3
MS 103	Military Training	1
PE	Physical Education	1

First Quarter			SECOND YEAR			Third Quarter		
			Second Quarter					
AR 210 Industrial Design	5		AR 211 Industrial Design	5		AR 212 Industrial Design	5	
PG 211 Psychology I	3		AR 222 Tech. Illustration	5		AR 223 Indus. Des. Methods	5	
AR 221 Mats. & Technology	5		EG 105 Engr. Drawing II	2		EG 204 Kinematics of Mach.	3	
EG 104 Descr. Geometry	2		IL 103 Machine Tool Lab.	1		PS 204 Survey in Physics	5	
IL 104 Sheetmetal Des.	1		IL 105 Foundry Tech.	1		MS 203 Military Training	1	
MS 201 Military Training	1		MS 202 Military Training	1				
CH 101 Intr. to Chemistry	2		CH 102 Intr. to Chemistry	2				
			THIRD YEAR					
AR 310 Industrial Design	5		AR 311 Industrial Design	6		AR 312 Industrial Design	5	
EC 200 General Economics	5		AT 338 Art History I	5		EC 331 Prin. of Marketing	5	
*Elective	3		IL 308 Gages & Measurements	5		**AR 308 Design Workshop	3	
*Elective	3		*Elective	3		*Elective	3	
			FOURTH YEAR					
AR 410 Industrial Design	6		AR 411 Industrial Design	6		AR 412 Ind. Des. Thesis	6	
PG 461 Industrial Psychology	5		AR 413 Hy. of Ind. Design	5		AR 485 Seminar in Ind. Des.	5	
*Elective	3		PG 490 Spec. Problems Pay: (Human Engineering)	5		SY 408 Industrial Sociology	5	
*Elective	3							

### Total — 210 quarter hours

\*Electives must come from the list of approved electives.

\*\*Not required for students in Advanced ROTC.

## Department of Art

The Department of Art is primarily concerned with professional education in Art. Its curricula are directed toward training students who wish to become professional designers or practitioners in the fine arts. To this end a program of studio courses is combined with studies of the functions and historical background of the visual arts. Courses in general education promote in the student a comprehension of his responsibilities to the society and culture in which he lives.

Two curricula are offered: Fine Arts and Visual Design, each leading to the degree of Bachelor of Fine Arts. The first two years of the two curricula are fairly similar. Emphasis is given to a fundamental grasp of drawing, design, color, texture and material with the aim of stimulating a creative use of these elements. Following these basic years, curriculum content varies considerably as the student enters more into his professional field.

Students in the School of Education may elect a minor or a major in Art (See page 127). Students in the School of Arts and Sciences may elect a minor (15 hours) or a double minor (30 hours) in Art.

The Department of Art is a member of the National Association of Schools of Art and the College Art Association.

## Fine Arts

Following two years of basic studies, the student, with faculty approval, enters advanced courses in painting, sculpture and printmaking. Preferences are emphasized through art electives and through academic electives from other areas of the University.

Graduates in Fine Arts may elect to practice in their chosen fields or to teach at advanced levels. Students who contemplate teaching as a career should plan to work toward a Master of Fine Arts degree at this or another institution.

## Curriculum in Fine Arts (FA)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
AT 105 Drawing I .....5	AT 106 Drawing II .....5	AT 107 Drawing III .....5
AT 181 Design Fundamentals 5	AT 113 Perspective .....3	AT 182 Design Fundamentals 5
EH 101 English Comp. ....3	EH 102 English Comp. ....3	EH 103 English Comp. ....3
HY 101 World History .....3	HY 102 World History .....3	HY 103 World History .....3
MS Military Training .....1	IL 102 Welding Sci. and Appl. ....1	MS Military Training .....1
PE Physical Education .....1	MS Military Training .....1	PE Physical Education .....1
	PE Physical Education .....1	
SECOND YEAR		
AT 338 Art History I .....5	AT 227 Sculpture I .....5	AT 205 Figure Drawing I .....5
*Natural Science .....5	*Natural Science .....5	AT 222 Painting I .....5
***FL Foreign Language .....5	***FL Foreign Language .....5	***FL Foreign Language .....5
**PA 211 Intr. to Deductive Logic .....3	**PA 212 Intr. to Deductive Logic .....3	Elective .....3
MS Military Training .....1	MS Military Training .....1	MS Military Training .....1
THIRD YEAR		
AT 215 Figure Construction 5	AT 307 Figure Drawing II 5	AT 305 Printmaking I .....5
AT 224 Painting II .....5	AT 322 Painting III .....5	AT 327 Sculpture II .....5
AT 339 Art History II .....5	Elective .....5	Elective .....5
EH 253 Lit. in English .....3	EH 254 Lit. in English .....3	Elective .....5
FOURTH YEAR		
AT 324 Painting IV .....5	AT 422 Painting V .....5	AT 496 Thesis .....5
AT 405 Printmaking II .....5	Elective .....5	Elective .....5
AT 427 Sculpture III .....5	Elective .....5	Elective .....5

## Total — 209 quarter hours

\*A student must satisfy a minimum requirement of 10 hours in one of the following:

Biology 101-4, Chemistry 103-4, Physics 205-6, Geology 101-2 or 101-3.

\*\*Mathematics may be substituted for PA 211 and 212.

\*\*\*15 hours of foreign language must be taken in the same language. Students may elect French, Spanish, or German.

A minimum of 20 hours must be taken in the two academic areas of Mathematics — Natural Sciences and Social Science, with at least one course in each area.

## RECOMMENDED ELECTIVES:

Natural Sciences: Geology, Zoology, Botany, Chemistry, Physics and Mathematics.

Social Sciences: Psychology, Sociology, Geography, Anthropology, Archaeology.

## Visual Design

The program in Visual Design gives fundamental training in the techniques of visual communication. Following the two year course in basic art principles, and with faculty approval, the student enters Visual Design. A core curriculum emphasizes the techniques of drawing for reproduction, lettering and typographical layout. The student is encouraged to think creatively within the limits of materials and processes. Beginning the third year, the student develops special interests in painting, printmaking, sculpture, illustration or fashion through a series of art electives. A balanced group of academic subjects helps to further an understanding of the function of design in commerce and industry. This breadth of background increases the possibility of future advancement to administrative work.

## Curriculum in Visual Design (VD)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
AT 105 Drawing I .....5	AT 106 Drawing II .....5	AT 107 Drawing III .....5
AT 181 Design Fundamentals I .....5	AT 113 Perspective .....3	AT 182 Design Fundamentals II .....5
EH 101 English Comp. ....3	EG 102 Engineering Dwg. ....2	EH 103 English Comp. ....3
HY 101 World History .....3	EH 102 English Comp. ....3	HY 103 World History .....3
MS Military Training .....1	HY 102 World History .....3	MS Military Training .....1
PE Physical Education .....1	MS Military Training .....1	PE Physical Education .....1
	PE Physical Education .....1	

SECOND YEAR		
First Quarter	Second Quarter	Third Quarter
AT 211 Lettering .....5	AT 205 Figure Drawing I .....5	AT 215 Figure Construction .....5
AT 227 Sculpture I .....5	AT 212 Graphic Processes .....5	AT 224 Painting II .....5
*PA 211 Intr. to Deductive Logic .....3	AT 222 Painting I .....5	EH 253 English Literature .....3
**BI 101 Prin. of Biology .....5	*PA 212 Intr. to Deductive Logic .....3	**BI 104 Bio. in Human Affairs .....5
MS Military Training .....1	MS Military Training .....1	MS Military Training .....1
THIRD YEAR		
AT 381 Visual Design I .....5	AT 382 Visual Design II .....5	AT 383 Visual Design III .....5
AT 307 Figure Drawing II .....5	AT 355 Illustration I .....5	AT 361 Fashion I .....5
AT 338 Art History I .....5	AT 339 Art History II .....5	EC 200 General Economics .....5
PG 211 Psychology I .....3	PG 212 Psychology II .....5	EH 254 English Literature .....3
FOURTH YEAR		
AT 481 Visual Design IV .....5	AT Art Elective .....5	AT 497 Thesis .....5
AT Art Elective .....5	Natural Science Elect. ....5	Elective .....5
EG 331 Prin. of Marketing .....5	Elective .....5	Elective .....5

### Total — 210 quarter hours

\*Mathematics may be substituted for PA 211 and 212.

\*\*Chemistry 103-4, Physics 205-6, or Geology 101-2 or 101-4 may be substituted for Biology 101-4.

A minimum of 20 hours must be taken in the two academic areas of Mathematics — Natural Sciences and Social Science, with at least one course in each area.

### RECOMMENDED ELECTIVES:

Natural Sciences: Geology, Zoology, Botany, Chemistry, Physics and Mathematics.

Social Sciences: Psychology, Sociology, Geography, Anthropology, Archaeology.

### Graduate Work in Fine Arts

Students who hold the degree of Bachelor of Visual Arts, Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate course leading to the degree Master of Fine Arts. For details examine the Bulletin of the Graduate School.

## Department of Building Technology

The Department of Building Technology offers courses regarding the structural design of buildings, the design of mechanical and other equipment for buildings, the practical application of building materials, the estimation of building costs, methods of construction and field erection procedures. These courses lead to the degree of Bachelor of Building Construction.

### Curriculum in Building Construction (BC)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
BT 101 Intr. to Building .....3	BT 102 Drawing & Proj. ....3	GL 102 Geology .....3
EH 101 English Comp. ....3	EH 102 English Comp. ....3	EH 103 English Comp. ....3
HY 101 World History .....3	HY 102 World History .....3	HY 103 World History .....3
MH 160 Algebra & Trig. ....5	MH 161 Anal. Geom. & Cal. ....5	MH 162 Anal. Geom. & Cal. ....5
MS Military Training .....1	MS Military Training .....1	MS Military Training .....1
PE Physical Education .....1	PE Physical Education .....1	PE Physical Education .....1
SECOND YEAR		
EC 200 Gen. Economics .....5	EC 211 Intr. Accounting .....5	BT 220 Mech. of Structures .....5
MH 163 Anal. Geom. & Cal. ....5	CE 201 Surveying .....5	EC 212 Intr. Accounting .....5
PS 205 Physics .....5	PS 206 Physics .....5	BT 206 Maths. & Constr. ....5
MS Military Training .....1	MS Military Training .....1	MS Military Training .....1

THIRD YEAR			Third Quarter		
First Quarter			Second Quarter		
BT 321 Constr. Prob. I	5	EC 445 Indus. Relations or	BT 313 Structures III	3	
BT 311 Structures I	3	EC 350 Labor Problems	BT 369 Hist. of Bldg. III	3	
BT 367 History of Bldg. I	3	BT 312 Structures II	Technical Elective	5	
Group Elective	5	BT 368 Hist. of Bldg. II	Group Elective	5	
English Elective	3	Group Elective	Elective	3	
		English Elective			
FOURTH YEAR					
BT 433 Constr. Methods & Estimating I	5	BT 434 Const. Meth. & Estimating II	BT 490 Building Const. Thesis	7	
BT 422 Constr. Prob. II	5	BT 452 Bldg. Equip. I	BT 453 Bldg. Equipment II	3	
BT 411 Structures IV	3	Technical Elec.	Technical Elective	5	
BT 412 Struct. V	3	Elective	Elective	3	
Elective	3	Elective			

### Total — 209 quarter hours

Six hours of Advanced ROTC may be substituted for two three-hour General Electives. English Electives will be restricted to courses in English. Group Electives will be restricted to the courses included in the Group Elective list. Technical Electives will be chosen from 300 (or above) numbered courses which are closely allied to the student's professional field.

#### GROUP ELECTIVES

EC 202 Economics II	HY 430 History of Europe from Bismarck through the First World War
EC 345 Statistics	HY 431 History of Europe Since the Treaty of Versailles
EC 457 Economic History of Europe	HY 451 Japan and Southeast Asia
EC 458 Economic History of the U.S.	HY 460 Great Leaders of History
EC 402 American Industries	PA 325 Aesthetics
EC 442 Personnel Management	PA 420 Modern Philosophy
EC 452 Comparative Economic Systems	PG 330 Social Psychology
EC 460 Economic Development of the South	PO 209 Intr. to American Government
FL 121-2-221 French	SP 211 Essentials of Public Speaking
FL 131-2-231 Spanish	SY 201 Introductory Sociology
FL 241-2-341 Italian	SY 203 Cultural Anthropology
FL 151-2-251 German	SY 301 Sociology of the Family
GY 305 Geography of North America	SY 304 Minority Groups
HY 311 Medieval History	SY 401 Population Problems
HY 400 American Colonial History	SY 402 Social Theory
HY 406-7 Recent United States History	SY 403 Contemporary Anthropology
HY 404 The Civil War	SY 405 Urban Sociology
HY 408 Modern America	SY 408 Industrial Sociology
HY 426 The Reformation Era, 1500-1660	
HY 428 The Age of Reason, 1660-1789	

Students who desire to take a second degree in Civil Engineering after graduation in Building Construction can do so in a minimum of four quarters, by substituting in the Building Construction curriculum Physics 201, 202, 203 in place of Physics 205, 206; and by taking Surveying 203 and Chemistry 103-103L, and 104-104L. By using electives and by carrying a one or two hour overload in some quarters, these substitutions and additions need not prolong the completion of the requirements for the Building Construction degree beyond the normal length of 12 quarters.

The additional training to be obtained from this extra work in Civil Engineering will provide strong supplementary skills for any member of the building industry.

### Master of Building Construction

Students holding the degree of Bachelor of Building Construction are eligible to apply to the Dean of the Graduate School for admission to the graduate course leading to the degree of Master of Building Construction. The candidate must complete satisfactorily the following curriculum, or its equivalent, as approved by the Dean of the Graduate School, totaling 60 quarter hours.

CE 407 Municipal Engineering	5
EC 434 Purchasing	5
EC 447 Job Evaluation	3
EC 448 Incentive Methods	3
BT 605-6-7 Graduate Research in Building	15
BT 621-2-3 Graduate Construction Design	15
CE 630 Advanced Stress Analysis	5
BT 699 Research and Thesis	10

## Department of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers to the Music major a professional curriculum leading to the degree Bachelor of Music, with majors in (A) Applied Music, (B) Theory and Composition, (C) Church Music. These programs provide preparation for the professional field of performance and for private or college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts degree. This degree is a cultural, not a professional degree.

Many general elective courses are available to all University students as well as courses in applied music in band and orchestral instruments, voice, piano, and organ. Performance groups such as the Marching and Concert Bands, Orchestra, Glee Clubs, Concert Choir, Choral Union, and Opera Workshop are also available to students in all curricula.

### Professional Curriculum in Music (MU)

#### (A) Applied Music Major

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. 3	EH 102 English Comp. 3	EH 103 English Comp. 3
HY 101 World History 3	HY 102 World History 3	HY 103 World History 3
MU 131 Mat. & Org. of Music 5	MU 132 Mat. & Org. Mu. 5	MU 133 Mat. & Org. Mu. 5
MU 181 Applied Music (major) 3	MU 182 Applied (major) 3	MU 183 Applied (major) 3
MU 187 Applied Music (minor) 1	MU 188 Applied (minor) 1	MU 189 Applied (minor) 1
MU Performing Group 1	MU Perf. Group 1	MU Perf. Group 1
MS Military Training 1	MS Military Training 1	MS Military Training 1
PE Physical Education 1	PE Physical Education 1	PE Physical Education 1
MU 100 Convocation 0	MU 100 Convocation 0	MU 100 Convocation 0

SECOND YEAR		
MU 231 Mat. & Org. of Music 5	MU 232 Mat. & Org. Mu. 5	MU 233 Mat. & Org. Mu. 5
Natural Science 5	Natural Science 5	MH 100 Mathematics 5
MU 281 Applied Music (major) 3	MU 282 Applied (major) 3	MU 283 Applied (major) 3
MU 287 Applied Music (minor) 1	MU 288 Applied (minor) 1	MU 289 Applied (minor) 1
MU Performing Group 1	MU Perf. Group 1	MU Perf. Group 1
MU Ensemble 1	MU Ensemble 1	MU Ensemble 1
MS Military Training 1	MS Military Training 1	MS Military Training 1
MU 100 Convocation 0	MU 100 Convocation 0	MU 100 Convocation 0

Total — 216 quarter hours



## THIRD YEAR

## First Quarter

MU 331	Mat. & Org. Music	5
PA 211	Philosophy	3
MU 351	Music History	3
MU 381	Applied Music (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Social or Natural Science)	3

## Second Quarter

MU 332	Mat. & Org. Mu.	5
PA 212	Philosophy	3
MU 352	Music History	3
MU 382	Applied (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective Soc. or Nat. Science)	3

## Third Quarter

MU 333	Mat. & Org. Mu.	5
MU 361	Conducting	3
MU 353	Music History	3
MU 383	Applied (major)	3
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	3

## FOURTH YEAR

FL	Foreign Language	5
MU 481	Applied Music (major)	3
MU 337	Modern Harmony	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Social or Natural Science)	6

FL	Foreign Lang.	5
MU 482	Applied (major)	3
MU	Pedagogy	3
MU	Ensemble	1
MU 362	Conducting	1
MU 100	Convocation	0
	Elective	3

FL	Foreign Language	5
MU 483	Applied (major)	3
MU	Ensemble	1
MU 363	Conducting	1
MU 100	Convocation	0
	Elective	3

Total - 205 quarter hours

## (B) Theory and Composition Major

## FIRST YEAR

## First Quarter

EH 101	English Comp.	3
HY 101	World History	3
MU 131	Mat. & Org. Music	5
MU 184	Applied Music	1
MU 116	Woodwind Instr.	1
MU 110	String Instr.	1
MS	Military Training	1
PE	Physical Education	1
MU 100	Convocation	0

## Second Quarter

EH 102	English Comp.	3
HY 102	World History	3
MU 132	Mat. & Org. Mu.	5
MU 185	Applied Music	1
MU 117	Woodwind Instr.	1
MU 111	String Instr.	1
MU	Perf. Group	1
MS	Military Training	1
PE	Physical Education	1
MU 100	Convocation	0

## Third Quarter

EH 103	English Comp.	3
HY 103	World History	3
MU 133	Mat. & Org. Mu.	5
MU 186	Applied Music	1
MU 118	WW Instr.	1
MU 112	String Instr.	1
MU	Perf. Group	1
MS	Military Training	1
PE	Physical Education	1
MU 100	Convocation	0

## SECOND YEAR

MU 231	Mat. & Org. of Music	5
	Natural Sciences	5
MU 284	Applied Music	1
MU 113	Brass Instr.	1
MU 107	Voice Class	1
PG 211	Psychology	3
MU	Perf. Group	1
MU	Ensemble	1
MS	Military Training	1
MU 100	Convocation	0

MU 232	Mat. & Org. Mu.	5
	Natural Science	5
MU 285	Applied Music	1
MU 114	Brass Instr.	1
MU 108	Voice Class	1
PG 212	Psychology	3
MU	Perf. Group	1
MU	Ensemble	1
MS	Military Training	1
MU 100	Convocation	0

MU 233	Mat. & Org. Mu.	5
MH 100	Mathematics	5
MU 286	Applied Music	1
MU 115	Brass Instr.	1
MU 119	Percussion In.	1
MU	Perf. Group	1
MU	Ensemble	1
MS	Military Training	1
MU 100	Convocation	0

## THIRD YEAR

MU 331	Mat. & Org. Music	5
MU 351	Music History	3
MU	Modern Harmony I	3
MU 437	Orchestration	3
MU 387	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	3

MU 332	Mat. & Org. Mu.	5
MU 352	Music History	3
MU	Modern Harm. II	3
MU 438	Orchestration	3
MU 388	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	3

MU 333	Mat. & Org. Mu.	5
MU 353	Music History	3
MU	Modern Harm. III	3
MU 389	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	6

## FOURTH YEAR

MU 434	Music Comp.	3
FL	Foreign Language	5
MU 487	Applied Music	1
MU 439	Orchestration	3
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	6

MU 435	Music Comp.	3
FL	Foreign Language	5
MU 488	Applied Music	1
MU 445	Theory Pedagogy	3
MU	Perf. Group	1
MU 100	Convocation	0
	Elective	3

MU 436	Music Comp.	3
FL	Foreign Language	5
MU 489	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective	3

Total - 210 quarter hours

## (C) Church Music Major

First Quarter			FIRST YEAR			Third Quarter		
			Second Quarter					
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Mu.	5	MU 133	Mat. & Org. Mu.	5
MU 181	Applied Music	3	MU 182	Applied (major)	3	MU 183	Applied (major)	3
	(major)	3	MU 188	Applied (minor)	1	MU 189	Applied (minor)	1
MU 187	Applied Music	1	MU	Ensemble	1	MU	Ensemble	1
	(minor)	1	MS	Military Training	1	MS	Military Training	1
MU	Ensemble	1	PE	Physical Education	1	PE	Physical Education	1
MS	Military Training	1	MU 100	Convocation	0	MU 100	Convocation	0
PE	Physical Education	1						
MU 100	Convocation	0						
			SECOND YEAR					
	Natural Science	5		Natural Science	5	MH 100	Mathematics	5
MU 231	Mat. & Org. Music	5	MU 232	Mat. & Org. Mu.	5	MU 233	Mat. & Org. Mu.	5
MU 281	Applied Music	3	MU 282	Applied (major)	3	MU 283	Applied (major)	3
	(major)	3	MU 288	Applied (minor)	1	MU 289	Applied (minor)	1
MU 287	Applied Music	1	MU	Ensemble	1	MU	Ensemble	1
	(minor)	1	MS	Military Training	1	MU 100	Convocation	0
MU	Ensemble (or	1	MU 100	Convocation	0		Elective	5
	MU 211)	1						
MS	Military Training	1						
MU 100	Convocation	0						
			THIRD YEAR					
PA 211	Philosophy	3	PA 212	Philosophy	3	MU 353	Music History	3
MU 351	Music History	3	MU 352	Music History	3	MU 333	Mat. & Org. Mu.	5
MU 331	Mat. & Org. Music	5	MU 332	Mat. & Org. Mu.	5	MU 383	Applied (major)	3
MU 381	Applied Music	3	MU 382	Applied (major)	3	MU	Ensemble	1
	(major)	3	MU 311	Liturgies	3	MU 100	Convocation	0
MU 312	Hymnology	3	MU	Ensemble	1		Elective (Soc. or	
MU	Ensemble	1	MU 100	Convocation	0		Nat. Science)	6
MU 100	Convocation	0						
			FOURTH YEAR					
FL	Foreign Language	5	FL	Foreign Language	5	FL	Foreign Language	5
MU 361	Conducting	3	MU 415	Organ Lit.	3	MU 416	Church Mu.	3
MU 481	Applied Music	3		or			Seminar	3
	(major)	3		Vocal Pedagogy		MU 483	Applied (major)	3
MU	Ensemble	1	MU 482	Applied (major)	3	MU	Ensemble	1
MU 100	Convocation	0	MU 362	Conducting	3	MU 453	Choral Lit.	3
	Elective (Soc. or		MU	Ensemble	1	MU 100	Convocation	0
	Nat. Science)	6	MU 100	Convocation	0			
				Elective (Soc. or				
				Nat. Science)	3			

Total - 210 quarter hours

## Bachelor of Arts

First Quarter			FIRST YEAR			Third Quarter		
			Second Quarter					
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Mu.	5	MU 133	Mat. & Org. Mu.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MU 184	Applied Music	3	MU 185	Applied (major)	3	MU 186	Applied (major)	1
	(major)	3	PA 211	Philosophy	3	MU	Ensemble	1
MU	Ensemble	1	MU	Ensemble	1	MU 100	Mathematics	5
MS	Military Training	1	MS	Military Training	1	MS	Military Training	1
PE	Physical Education	1	PE	Physical Education	1	MU 100	Convocation	0
MU 100	Convocation	0	MU 100	Convocation	0			
			SECOND YEAR					
MU 231	Mat. & Org. Music	5	MU 232	Mat. & Org. Mu.	5	MU 233	Mat. & Org. Mu.	5
	Natural Science	5		Natural Science	5	EH 255	English Lit.	3
EH 253	English Lit.	3	EH 253	English Lit.	3	MU 286	Applied (major)	1
MU 284	Applied Music	1	MU 285	Applied (major)	1	MU	Ensemble	1
	(major)	1	MU	Ensemble	1	AT 338	Art History	5
MU	Ensemble	1	MS	Military Training	1	MS	Military Training	1
MS	Military Training	1	MU 100	Convocation	0	MU 100	Convocation	0
PE	Physical Education	1					Elective	3
MU 100	Convocation	0						

THIRD YEAR		
First Quarter	Second Quarter	Third Quarter
MU 331 Mat. & Org. Music — 5	MU 332 Mat. & Org. Mu. — 5	MU 333 Mat. & Org. Mu. — 5
MU 351 Music History — 3	MU 352 Music History — 3	MU 353 Music History — 3
*MU 187 Applied Music — 1	MU 188 Applied (minor) — 1	MU 189 Applied (minor) — 1
(minor) — 1	MU 100 Convocation — 0	MU 100 Convocation — 0
PA 212 Philosophy — 3	Academic Minor — 5	Academic Minor — 5
MU 100 Convocation — 0	Elective (Soc. or	Elective (Soc. or
Academic Minor — 5	Nat. Science) — 3	Nat. Science) — 3
FOURTH YEAR		
PG 211 Psychology — 5	MU 361 Conducting — 3	MU 289 Applied (minor) — 1
*MU 287 Applied Music — 1	MU 288 Applied (minor) — 1	FL Foreign Language — 5
(minor) — 1	FL Foreign Language — 5	MU 100 Convocation — 0
FL Foreign Language — 5	MU 100 Convocation — 0	Academic Minor — 5
MU 100 Convocation — 0	Academic Minor — 5	Elective (Soc. or
Academic Minor — 5	Elective (Soc. or	Nat. Science) — 3
Elective (Soc. or	Nat. Science) — 3	
Nat. Science) — 3		

\*A minor of 30 quarter hours elected from approved courses.

Unless the applied major be a piano or organ the applied minor must be a keyboard instrument.

### Total — 208 quarter hours

#### Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. Attendance at campus music functions and student convocations is compulsory. Absences may be excused only by the Head of the Music Department.

2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses.

3. A. Students electing the applied music major must present a junior recital during the third year of study and a senior recital during the fourth year of study.

B. Students electing the theory and composition major must present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.

C. Students electing the history and literature major must present a written thesis during the fourth year of study.

D. Students electing the church music major must present a senior recital during the fourth year of study.

4. Credit in applied music is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.

5. Students whose major performing medium is not piano or organ must elect piano as the minor instrument. Before graduation all students must meet minimum Sophomore NASM applied music requirements in piano.

6. Participation in an approved music performing group is required each quarter, with or without credit.

7. All students taking applied music must meet public performance requirements as designated by the faculty. (See Music Dept. special regulations regarding requirements for jury examinations and convocation performances.)

## Music Education

**Teacher Education:** Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both the curriculum in music and Teacher Education training.

## Music Organizations

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See index under "Organizations." These activities, which are open to students of the University, may be taken without credit.

## Graduate Work in Music

Students who hold a baccalaureate degree in Education with a Major in Music are eligible to apply to the Dean of the Graduate School for admission to the graduate courses leading to the degrees Master of Science and Master of Education with Major in Music. The candidate must complete satisfactorily the following curriculum totaling 45 quarter hours.

Education and Foundation Courses	15
Music and Music Education Courses	30

## Department of Theatre

The purpose of the curriculum in theatre is to develop creative and professionally knowledgeable practitioners and teachers of the art. The program is organized to provide the prospective artist or artist/teacher a broad range of theatre experience which will enable him to identify and begin initial concentration on the area or areas of his particular ability.

Theatre training experiences are ordered in the following manner:

(1) An introductory year of study and testing. (2) A year devoted to the study and practice of performing. (3) A year devoted to all aspects of the performer's design environment. (4) A fourth year in which the student concentrates primarily on directing.

Particular attention is given to those students who plan to teach in elementary and secondary schools. These students are encouraged to complete the Department's courses in Children's Theatre, Creative Dramatics and Theatre in the Schools.

The Department offers a B.A. degree with a major in Theatre, which may also be taken as a major or minor in the School of Education or as a minor in any of the three options in the School of Arts and Sciences. Participation in the theatre season of plays is required of all majors and minors enrolled in the Department. The Department also offers general elective courses in Theatre practice and theory.

### Curriculum in Theatre (TH)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	HY 103 World History _____ 3
BI 101 Prin. of Biology _____ 5	BI 104 Biology in Human _____ 5	PA 210 Intr. to Philosophy _____ 3
BI 101L Gen. Prin. of _____ 5	TH 102 Intr. to the Arts _____ 1	TH 103 Intr. to the Arts _____ 1
TH 101 Intr. to the Arts _____ 1	TH 105 Intr. to Theatre II _____ 3	TH 106 Intr. Theatre _____ 3
TH 104 Intr. to Theatre I _____ 3	TH 108 Stage Craft II _____ 1	TH 109 Stage Craft Project _____ 1
TH 107 Stage Craft I _____ 1	MS Military Training _____ 1	MS Military Training _____ 1
MS Military Training _____ 1	PE Physical Education _____ 1	PE Physical Education _____ 1
PE Physical Education _____ 1		
SECOND YEAR		
TH 204 Fund. of Acting I: _____ 5	TH 205 Fund. of Acting II: _____ 5	TH 206 Acting I _____ 5
TH 201 Theatre Artist in _____ 3	TH 202 Theatre Artist in _____ 3	TH 203 Theories of Acting _____ 3
PA 211 Intr. to Deductive _____ 3	PG 211 Psychology I _____ 3	PG 212 Psychology II _____ 3
FL 121 Elem. French _____ 5	FL 122 Elem. French _____ 5	FL 221 Inter. French _____ 5
MS Military Training _____ 1	MS Military Training _____ 1	MS Military Training _____ 1
THIRD YEAR		
TH 304 Fund. Stage Design _____ 5	TH 305 Design in the _____ 5	TH 306 Design in the _____ 5
TH 301 Hist. of Theatre in _____ 3	TH 302 Hist. of Theatre in _____ 3	TH 303 Hist. of Theatre in _____ 3
EH 253 English Lit. _____ 3	EH 254 English Lit. _____ 3	EH 255 English Lit. _____ 3
AT 338 Art History I _____ 5	AT 339 Art History II _____ 5	EH 332 Hist. of Eng. Drama _____ 3
MU 373 Apprec. of Music _____ 3	MU 374 Masterpieces of _____ 3	TH Elective _____ 3
FOURTH YEAR		
TH 404 Directing I _____ 5	TH 405 Directing II _____ 5	TH 406 Directing III _____ 5
TH 401 Play Analysis _____ 3	TH 402 World Theatre _____ 3	TH 403 Seminar in _____ 3
TH Elective _____ 5	Elective _____ 5	Theatre Research _____ 3
TH Elective _____ 3	Elective _____ 5	Elective _____ 3
TH 199 Theatre Lab. _____ 2	TH 199 Theatre Lab. _____ 2	Elective _____ 3

Total — 210 quarter hours

# School of Arts and Sciences

EDWARD H. HOBBS, *Dean*  
LESLIE CAMPBELL, *Assistant Dean*

**T**HE SCHOOL OF ARTS AND SCIENCES traces its origin to 1859 and the Academic Faculty of East Alabama Male College, predecessor of Auburn University. It was known as the School of Science and Literature from 1929 to 1968, when it became the School of Arts and Sciences. Three academic areas — humanities, physical sciences, and social sciences — are represented by the School's 12 departments — Chemistry, English, Foreign Languages, Geology, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Sociology, and Speech.

In keeping with the traditional role of a School of Arts and Sciences, the aim of its program is to give the student a broad general education as well as an opportunity to acquire depth in a particular academic subject which he selects for a major. Thus the guiding intent of the School is, on the one hand, to prepare the student to become a responsible citizen in the modern world and, on the other, to equip him with a strong foundation for later specialization should he desire to engage in post-baccalaureate study in a graduate or professional school. Students of all other instructional divisions of the University enroll in its courses to meet their own educational objectives.

## Three Curriculum Areas

The School of Arts and Sciences offers four-year bachelor's degree programs in three curriculum areas: (1) **general**, (2) **pre-professional**, and (3) **special**.

**The General Curriculum** offers options in 16 major fields, with elective minors in 26 departmental areas. Nine of these majors lead to Bachelor of Arts and seven to Bachelor of Science degrees.

**Pre-professional** programs are offered in pre-law, pre-medicine, pre-dentistry, pre-pharmacy, and pre-veterinary medicine. If a pre-professional student gains early admission to a school of law, medicine, dentistry, or veterinary medicine, he may receive a combination baccalaureate degree upon completion of three years of pre-professional work and one year of professional school.

**Special Curricula** are available in chemistry, geology, laboratory technology, mathematics, physics, and applied physics.

## Student Advisers

In all curricula in which majors are offered, the Head Professor or his designate in the department in which the student majors becomes



the student's adviser and is charged with the responsibility of outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he declares a major. For pre-professional students, counseling on professional school admission tests, admissions requirements and other such matters is provided as follows: Pre-Medical Advisory Committee for pre-medical and pre-dental students; the Pre-Law Advisers; the Pre-Pharmacy Adviser; and the Pre-Veterinary Medicine Adviser. Advisory services for special curricula are provided by the appropriate departments.

### ***Foreign Language***

In all curricula in this school that require 15 hours in a foreign language, the work must be done in one language.

### ***Cooperative Programs in Mathematics, Physics, and Applied Physics***

Cooperative Educational Programs which give students an opportunity to integrate their academic training with work experience are offered in mathematics, physics, and applied physics. Students alternate each three or six months between school and a work assignment provided through the Director of the Cooperative Education Program.

### ***Graduate Degrees***

Master of Arts degrees are offered in the areas of English, history, political science, and speech. Master of Science degrees are offered in the areas of chemistry, mathematics, physics, and psychology. In addition, a Master of Political Science degree is offered at Air University in Montgomery, Alabama, through the Department of Political Science of Auburn University, and the School of Arts and Sciences participates in the offering of two interdisciplinary degrees, Master of Arts in College Teaching and Master of City and Regional Planning. Doctor of Philosophy degrees are offered in the areas of chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the Graduate School Bulletin.

### ***Liberal Education Program***

If the student follows the curricula offered by the School of Arts and Sciences, the basic requirements of the Liberal Education Program will be met.

## **The General Curriculum (GC)**

The general curriculum is designed to broaden the student through the humanities and the natural and social sciences. It also serves as a base for the majors listed below.

## **Majors and Symbols in the General Curriculum**

### **GC† – Major Undeclared**

#### **Bachelor of Arts**

GEH—English  
 GFL—Foreign Language  
 GHY—History  
 GJM—Journalism  
 GPA—Philosophy  
 GPO—Political Science  
 GPG—Psychology  
 GSP—Speech  
 GSY—Sociology

#### **Bachelor of Science**

GBI—Biology  
 GCH—Chemistry  
 GEC—Economics  
 GGL—Geology  
 GGY—Geography  
 GMH—Mathematics  
 GPS—Physics

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major which are printed under Special Requirements for Departmental Majors on pages 95-98.

**Minors:** Students who choose one of the above majors will select two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: Architecture, Art, Botany, Chemistry, Dramatics, Economics, Education, English, Foreign Language††, Geography, Geology, History, Home Economics, Journalism, Mathematics, Music, Philosophy, Physical Education, Physics, Political Science, Psychology, related subjects in Agriculture or Engineering, Office Administration, Sociology, Speech, and Zoology. All major and minor courses must be numbered 200 and above. A student cannot major and minor in the same field (except in Foreign Language; see page 96).

**Teacher Education:** Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Arts and Sciences to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the General Curriculum, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or senior high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the School of Arts and Sciences. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both the General Curriculum and Teacher Education training.

†A student undecided about a major may delay declaring one until the end of his fifth quarter. Before a major is declared, his curriculum will be identified by the symbol GC (General Curriculum). As soon as he is reasonably certain, however, he should declare his major and identify it by the appropriate departmental symbol.

††See special regulations under *The Foreign Language Major (GFL)* which pertains to minor requirements, page 96.

## FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL 1	For. Language*	5	FL 11	For. Language	5	FL 111	For. Language	5
	Group Elect. I**	3-5		Group Elect. II**	3-5		Group Elect. III**	3-5
	or			or			or	
MH 160	Algebra & Trig.**	5	MH 161	Anal. Geom. & Cal. I	5	MH 162	Anal. Geom. & Cal. II	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	Basic ROTC	1		Basic ROTC	1		Basic ROTC	1
PE	Physical Ed.	1	PE	Physical Ed.	1	PE	Physical Ed.	1

## SOPHOMORE YEAR

PO 209	American Govt.	5	PO 210	State & Local Govt.	5	SY 201	Intr. Sociology	5
	Group Elect. IV	3-5		Group Elect. IV	3-5		Group Elect. IV	3-5
	Group Elect. V	5		Group Elect. V	5		Group Elect. VI	5
EH 255	English Literature	3	EH 254	English Literature	3	EH 255	English Literature	3
	Basic ROTC	1		Basic ROTC	1		Basic ROTC	1

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

Majors in the humanities and social sciences during the first two years of enrollment in the General Curriculum should take a minimum of 15 hours in the natural sciences (at least 10 hours to be in one natural science) or a minimum of two courses in mathematics. All students enrolled in the General Curriculum who take two or more courses in mathematics may take a minimum of 10 hours in the natural sciences.

Group Elective I: The University Liberal Education mathematics-philosophy minimum requirement may be met by taking one of the following mathematics courses: MH 159, MH 160, or MH 161, or the following two courses in logic: PA 211 and PA 212.

Group Elective II: PA 212, MH 159, MH 160, MH 161, MH 162, or a 100 course of student's choice. If the latter option is elected by a student in the humanities or social sciences, a course in the natural sciences is recommended.

Group Elective III: MH 162, MH 163, or a 100 or 200 course of student's choice. If the latter option is elected by a student in the humanities or social sciences, a course in the natural sciences is recommended.

Group Elective IV: Geography (5 hours), PA 210, PA 211, PA 212, HY 201, HY 202, JM 221, PG 211, PG 212, Political Science (300 level), SP 202. (Chemistry majors should take CH 103-104-105 and labs or CH 111-112-113.)

Group Elective V: A minimum of 10 hours in one science (including labs) from the following: BI 101-102, BI 101-103, BI 101-104; CH 101-102-104, CH 103-104; GL 101-102; PS 220-221-222, or PS 205-206. (Chemistry majors should take PS 205-206.) If a student has met the natural science requirements of the Liberal Education Program, he may use one-half of these elective hours in music, drama or art.

Group Elective VI: EC 200, HY 201, HY 202, Political Science (300 level); a 100 or 200 level course in music, drama or art.

## JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and additional elective work to total 207 hours. All major and minor courses are to be numbered 200 or above. The normal load for juniors and seniors is 18 hours.

**Total — 207 quarter hours**

\*Fifteen hours are required in the same language. Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses.

\*\*Group Electives I, II, and III may be taken by majors in the humanities and social sciences; however, MH 160, MH 161, and MH 162 are required for majors in mathematics and natural sciences and are recommended for social science majors.

### Special Requirements for Departmental Majors

Students in these majors should consult with their advisers regularly to plan their major work, clear pre-requisites, and take their major courses according to departmental schedule. A minimum of 35 hours

is required in each major and 15 in each minor. All courses must be numbered 200 or above.

**The Biology Major (GBI).** The Arts and Sciences student selecting a major in biology will take BI 101, BI 102, BI 103, CH 103, CH 104, CH 105, including labs, and MH 160, MH 161 among his electives; and CH 207, CH 208, CH 209, PS 205, and PS 206 among his electives or on his minors. The major will include BY 306, BY 406, ZY 300, ZY 424 or ZY 214, and VM 200 plus 10 additional hours to be chosen from the following: BY 309, BY 410, BY 411, BY 413, BY 414, BY 415, BY 416, ZY 301, ZY 302, ZY 303, ZY 304, ZY 306, ZY 308, ZY 310, ZY 401, ZY 409, ZY 411, ZY 421-422, and ZY 450. (See also Special Curriculum in Biology in the School of Agriculture.)

**The Chemistry Major (GCH).** The student selecting a chemistry major under the General Curriculum will take CH 103, CH 104, CH 105 and labs (or CH 111, CH 112, CH 113), MH 160, MH 161 and MH 162 among his electives; and PS 205 and PS 206 (or PS 201, PS 202, PS 203) among his electives or on a minor. The major will include CH 204, CH 205, CH 207, CH 208, and CH 209 plus 10 additional hours of chemistry on the 300-400 level. (See also Special Curriculum in Chemistry.)

**The Economics Major (GEC).** The Arts and Sciences student selecting a major in economics will take MH 160 and MH 161 during his freshman or sophomore year, EC 200 during his sophomore year, and IE 301 during his junior or senior year. The major will include EC 202, ACF 274, EC 360, EC 451, and either EC 446 or EC 456, plus 10 additional hours in Economic Theory (EC 446, EC 452, EC 453, EC 454, EC 456, EC 462, EC 465, EC 471, MT 472). (See also Economics Curriculum in the School of Business.)

**The English Major (GEH).** Twenty hours of foreign language preferably in one language, and five hours of history (English or European) are required for the English major. The student should work out a balanced program with his English faculty adviser. This program should include: (a) EH 390, EH 401, or EH 441; (b) three courses selected from different periods, each of the three emphasizing a different type of literature (i.e. fiction, poetry, drama); (c) three survey or period courses dealing with the literature of different ages.

**The Foreign Language Major (GFL).** A major will normally consist of 35 hours in one language beyond the 15-hour freshman requirement, a total of 50 hours. A minor will consist of 15 hours in one language beyond the freshman requirement, a total of 30 hours. A student who majors and minors in two foreign languages may satisfy both requirements with a total of 70 hours, 40 hours in his major and 30 hours in his minor, including the freshman requirements. In no case may more than 70 hours of foreign languages be used toward a bachelor's degree.

**The Geography Major (GGY).** A major in geography will take GY 102 as Group Elective II, GY 103 as Group Elective III and include

GY 201, GY 305, GY 404, and GY 405 on his major of 35 hours. (See also Geography curriculum in the School of Business.)

**The Geology Major (GGL).** The student selecting a major in geology shall take: a minimum of 35 hours in geology courses numbered 200 and above; mathematics through MH 163 in his freshman and sophomore years; a minimum of three 15-hour sequences in biology, chemistry, and physics; and two 15-hour minor sequences (or one 30-hour double minor sequence) chosen from courses at the 200 level or above in the departments of Agronomy and Soils, Botany, Chemistry, Mathematics, Physics, or Zoology. (Note: Students choosing the PS 201-202-203 sequence should also take MH 264.) A minor in geology consists of (1) GL 301, GL 302, and either GL 401, GL 402, or GL 403; or (2) GL 311, GL 312, and GL 401. A double minor in geology consists of GL 301, GL 302, GL 401, GL 402, GL 403, and either GL 421 or GL 422. (See also Special Curriculum in Geology.)

**The History Major (GHY).** A major must include HY 201 and HY 202. The student should consult the History Department each quarter of the junior and senior years regarding completion of his major and minor fields.

**The Journalism Major (GJM).** Thirty-six hours of course work in journalism are required for the major. JM 221, JM 223, JM 224, JM 322 and JM 421 must be taken by all majors. The additional 11 hours must include either JM 323 or JM 465 plus JM 422, JM 423 (Journalism Workshop, six hrs.), or JM 425 (Journalism Internship, six hrs.). Students majoring or minoring in journalism should consult the journalism faculty about their programs of study. JM 221 should be scheduled during the sophomore year.

**The Mathematics Major (GMH).** A major in mathematics should take MH 160 or MH 161, as appropriate, during his first quarter and complete the freshman calculus sequence MH 161, MH 162, MH 163 as early in his program as possible. He then will meet his major requirements by following one of two plans. **Plan I** is oriented toward theoretical mathematics and under it a student must select at least seven courses appearing in the last three years of the Mathematics Curriculum on page 107. This plan may be used to prepare for graduate study in mathematics. Under **Plan II** a student must take MH 220, MH 221, MH 265, MH 266, MH 331, MH 405, MH 460 or MH 461, and MH 467. This program provides appropriate preparation in mathematics for a computer-related career. A suitable minor may be based on courses taught in the School of Engineering. A mathematics minor will involve a minimum of 15 hours in 200-level courses or above, but may not include courses numbered in the 280's or 480's. (See also Special Curriculum in Mathematics.)

**The Philosophy Major (GPA).** The student who wishes to major in Philosophy should follow the General Curriculum closely and should have taken PA 210 and PA 211 prior to enrolling in his major courses. In addition to these courses, the major includes 35 hours of which ten should be in the history of philosophy involving any combination of PA 410, PA 420, PA 425, PA 440, PA 470, PA 475; five hours in either

Aesthetics PA 325, or Ethical Theory PA 404; five hours in Metaphysics PA 455, or Epistemology PA 460; five hours in Symbolic Logic PA 403, or Philosophy of Science PA 400; five hours in Existentialism PA 402, or Contemporary Philosophy PA 430; and any one other five-hour philosophy course above 200. Majors should consult with the Department respecting minor areas and electives. The **minor** should include 15 hours of philosophy in addition to PA 210 and PA 211. PA 310 and PA 315 may not be taken as part of either the major or the minor.

**The Physics Major (GPS).** The student selecting a **major** in physics will take mathematics through MH 163 in his freshman and sophomore years, and MH 264 among his electives or on a minor. While not required, MH 265 and MH 266 are recommended during his junior year. Ten hours in another natural science (with laboratory) must be completed. The **major** will include PS 205, PS 206, and PS 210 (or PS 220, PS 221, PS 222, and PS 320), PS 217, PS 300, PS 301 or PS 302, PS 303 or PS 304, and PS 305. A **minor** consists of PS 205, PS 206, and PS 210, (or PS 220, PS 221, PS 222, and PS 320). (See also Special Curricula in Physics and Applied Physics.)

**The Political Science Major (GPO).** The major will consist of 35 hours of political science beyond the 200 level of which at least 10 hours must be at the 400 level.

**The Psychology Major (GPG).** The student electing a **major** in psychology must complete PG 211 and PG 212, at least nine hours of experimental psychology, and 16 hours of psychology courses at the 400 level. In addition, he must complete MH 161 and preferably MH 162, as well as VM 220 and VM 221 or other science electives approved by his adviser.

**The Speech Major (GSP).** The areas of speech are (a) fundamentals, (b) public address, (c) interpretation, (d) television-radio-film, (e) audiology and speech pathology, and (f) group methods. A student may elect to pursue a general course of study by taking SP 200, SP 201, SP 202 and 25 additional hours with at least one course in the areas of c, d, e, and f; or he may emphasize audiology and speech pathology by taking SP 200, SP 201, SP 202 and 25 additional hours primarily in area e; or he may emphasize television-radio-film by taking SP 201, SP 202, SP 230, SP 235, SP 234 or SP 236 or SP 338, SP 436 or SP 438 or SP 439, and five hours in area a, c, or f.

**The Sociology Major (GSY).** A **major** in sociology will consist of a minimum of 40 hours of sociology courses following SY 201. These additional courses must include SY 202, SY 203, SY 220, and SY 309. In the selection of the remaining sociology courses to complete the major, the student is encouraged to consult with faculty members in the Department so as to take those courses most helpful for the attainment of the student's particular objectives.

## Pre-Professional Curricula

### Curriculum in Pre-Law (PL)

The pre-law curriculum is designed to prepare students for accredited professional law schools, most of which require for admission



a bachelor's degree, a good scholastic record, and a good score on the Law School Admission Test.

#### FRESHMAN AND SOPHOMORE YEARS

(Same as the General Curriculum except that EC 200 will be taken as a Group VI Elective.)

#### JUNIOR AND SENIOR YEARS

After completion of the first two years of the General Curriculum, the pre-law student will take three quarters of HY 205 Current Events in the junior year, and during the junior and senior years complete a major of at least 35 hours, two minors of at least 15 hours each or one double minor of at least 30 hours, and additional work to add up to a total of 207 hours, including EC 200, EC 202, ACF 215, EH 390, HY 471, PO 401, and SP 202. Recommended in addition to these are SP 278 and additional courses in political science. All major and minor courses are to be numbered 200 and above.

### *Majors and Symbols in the Pre-Law Curriculum*

#### PL — Undeclared Major

##### Bachelor of Arts

LEH—English  
LFL—Foreign Language  
LHY—History  
LJM—Journalism  
LPA—Philosophy  
LPO—Political Science  
LPG—Psychology  
LSP—Speech  
LSY—Sociology

##### Bachelor of Science

LBI—Biology  
LCH—Chemistry  
LGL—Geology  
LEC—Economics  
LGY—Geography  
LMH—Mathematics  
LPS—Physics

Since some of these majors require alignment of courses beginning in the freshman and sophomore years, it is important that the pre-law student be alert to all of the requirements of his major (printed under "Special Requirements for Departmental Majors" on pages 95-98) early in his college career. **Minors** may be chosen from those listed under the General Curriculum on page 94. The quarterly load for a pre-law student is 19 hours in the junior year and 18 hours in the senior year.

A pre-law student who is able to gain admission into an accredited professional law school short of a degree may obtain a combination bachelor's degree by completing the first three years of this curriculum (including the special requirements listed above) and the freshman year of law school.

The pre-law adviser will guide the student concerning law school admission requirements, and the department in which the student majors will guide him in his major work. The pre-law student should take the national Law School Admissions Test at least nine months ahead of the date he expects to enter law school.

**Total — 207 quarter hours**

### Curriculum in Pre-Dentistry (PD) and Pre-Medicine (PM)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for the rigorous demands of American medical and dental schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a medical or dental school.

The bachelor's degree is required by most dental and medical schools for admission; however, if a student is able to enter a dental or medical school prior to graduation, he may receive a combination BS degree by completing successfully the first nine quarters of this curriculum and the freshman year of professional school.

The Pre-Medical Advisory Committee will guide the pre-dental or pre-medical student concerning dental and medical school admission requirements, but the department in which the student majors will guide him in his major work. A student in pre-dentistry or pre-medicine should take the national Dental or Medical College Admission Test at least a year in advance of the date he plans to enter professional school, and follow with an application to the professional school of his choice. The student should seek information from the Pre-Medical Advisory Committee concerning procedures he must follow to obtain the necessary committee evaluation and recommendation to the professional school to which he seeks admission early in his junior year. Forms and instructions are available in the office of the Dean of Arts and Sciences.

#### FRESHMAN YEAR

##### First Quarter

CH 103	Gen. Chem. & Lab.	5
MH 160	Algebra & Trig.	5
EH 101	English Comp.	3
HY 101	World History	3
	Basic ROTC	1
PE	Physical Education	1

##### Second Quarter

CH 104	Gen. Chem. & Lab.	5
MH 161	Anal. Geom. & Cal. I	5
EH 102	English Comp.	3
HY 102	World History	3
	Basic ROTC	1
PE	Physical Education	1

##### Third Quarter

CH 105	Gen. Chem. & Lab.	5
MH 162	Anal. Geom. & Cal. II	5
EH 103	English Comp.	3
HY 103	World History	3
	Basic ROTC	1
PE	Physical Education	1

#### SOPHOMORE YEAR

CH 207	Organic Chemistry	5
PO 209	American Govt.	5
PS 205	Intr. Physics	5
HY 205	Current Events	1
	Basic ROTC	1

BI 101	Prins. Biol. & Lab.	5
CH 208	Organic Chemistry	5
PS 206	Intr. Physics	5
HY 205	Current Events	1
	Basic ROTC	1

BI 103	Gen. Anim. Biol. & Lab.	5
CH 209	Organic Chemistry	5
PS 210	Modern Physics	5
HY 205	Current Events	1
	Basic ROTC	1

Women students will take PE 111-112-113 Health Science in the freshman year and electives in the sophomore year in lieu of ROTC.

#### JUNIOR YEAR

CH 204	An. Chem. I & Lab.	5
ZY 301	Compar. Anatomy	5
	Group Elect. or Maj.	5
EH 141	Med. Vocabulary	3

CH 316	Phys. Chem. & Lab.	5
ZY 302	Vert. Embryology	5
	Group Elect. or Maj.	5
PA 211	Gen. Deduct. Logic	3

CH 317	Phys. Chem. & Lab.	5
ZY 300	Genetics	5
	Group Elect. or Maj.	5
PG 211	Psychology I	3

#### SENIOR YEAR

EH 390	Adv. English Comp.	5
	Group Elect. or Maj.	5
EH 253	English Literature	3
	Elective	3

PO 401	Amer. Const. Law	5
SY 201	Intr. Sociology	5
	Group Elect. or Maj.	5
EH 254	English Literature	3

	Group Elect. or Maj.	5
	Group Elect. or Maj.	5
EH 255	English Literature	3
	Elective	3

### Total — 209 quarter hours

Group Electives (minimum 35 hours): EC 200, EC 202, \*FL (a minimum of 15 hours in the same language), GL 101, GL 102, IE 301, MH 163, MH 264, MH 361, PA 202, PA 210, PG 212, PG 330, SP 202, SY 203, SY 207, VM 200, ZY 310 or ZY 424, and/or up to 10 hours of 300-400 level courses in English, history, philosophy, political science, and sociology.

\*Fifteen hours are required in the same language. Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses. (For further information see page 242.)

**Technical Option:** Pre-dental and pre-medical students who prefer a more technical undergraduate education should continue mathematics through MH 264, substitute CH 111-112-113 for CH 103-104-105; take CH 205 to follow CH 204; substitute PS 201-202-203 for PS 205-206-210; and CH 407-408-409 for CH 316-317, the extra courses being used as Group Electives. The remaining requirements should be chosen from the humanities, social sciences and fine arts to avoid sacrificing the liberal education required by the professional schools.

**Major Option:** Professional schools are becoming increasingly interested in students who reach some degree of depth especially in a non-medical related discipline. Accordingly, majors are offered in the humanities and social sciences as well as the natural sciences, all leading toward the BS degree, as follows:

#### **Pre-Dentistry**

PD—Major Undeclared  
 DBI—Biology  
 DCH—Chemistry  
 DEC—Economics  
 DEH—English  
 DFL—Foreign Language  
 DGL—Geology  
 DGY—Geography  
 DHY—History  
 DJM—Journalism  
 DMH—Mathematics  
 DPA—Philosophy  
 DPO—Political Science  
 DPG—Psychology  
 DPS—Physics  
 DSP—Speech  
 DSY—Sociology

#### **Pre-Medicine**

PM—Major Undeclared  
 MBI—Biology  
 MCH—Chemistry  
 MEC—Economics  
 MEH—English  
 MFL—Foreign Language  
 MGL—Geology  
 MGY—Geography  
 MHY—History  
 MJM—Journalism  
 MMH—Mathematics  
 MPA—Philosophy  
 MPO—Political Science  
 MPG—Psychology  
 MPS—Physics  
 MSP—Speech  
 MSY—Sociology

Students electing a major under this option should become acquainted with the special requirements for his major on pages 95-98 as early as possible as some majors require alignment of courses beginning in the freshman, sophomore, or junior years.

**Pre-Nursing Option:** May be worked out with the Dean's Office.

**Pre-Optometry Option:** May be worked out with the Dean's Office.

**Pre-Therapy Option:** May be worked out with the Dean's Office.

#### **Curriculum in Pre-Pharmacy (PPY)**

The curriculum in Pre-Pharmacy is designed to meet the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in Pharmacy may be found on page 164.

To gain admission to the professional curriculum, a student must complete the basic two-year requirements below with a 1.00 (C) average

or better and receive favorable approval of an application for admission submitted to the Admissions Committee of the School of Pharmacy.

**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
CH 103	Gen. Chem. & Lab.	.5	CH 104	Gen. Chem. & Lab.	.5	BI 101	Prins. Biol. & Lab.	.5
MH 160	Algebra & Trig.	.5	MH 161	An. Geom. & Cal. I	.5	CH 105	Gen. Chem. & Lab.	.5
EH 101	English Comp.	.3	EH 102	English Comp.	.3	EH 103	English Comp.	.3
HY 101	World History	.3	HY 102	World History	.3	HY 103	World History	.3
	Basic ROTC	.1		Basic ROTC	.1		Basic ROTC	.1
PE	Physical Ed.	.1	PE	Physical Ed.	.1	PE	Physical Ed.	.1

**SOPHOMORE YEAR**

BI 102	Gen. Plant Biol. & Lab.	.5	BI 103	Gen. Anim. Biol. & Lab.	.5	CH 208	Organic Chemistry	.5
CH 204	An. Chem. & Lab.	.5	CH 207	Organic Chemistry	.5	PS 206	Intr. Physics	.5
	Group I Elective	.3	PS 205	Intr. Physics	.5		Group I Elective	.5
	Group I Elective	.3		Group I Elective	.3		Group I Elective	.3
	Basic ROTC	.1		Basic ROTC	.1		Basic ROTC	.1

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

**Total — 109 quarter hours**

Group I Electives: These three- and five-hour electives may be interchanged; they should be chosen from the areas of art, business, drama, economics, English, foreign language\*, geography, history, mathematics, music, philosophy, political science, psychology, sociology, and speech. Recommended courses are EC 200, EC 202, ACF 211, ACF 212, MN 341, EH 141, EH 255, EH 254, EH 255, \*FL (10 hours), HY 201, HY 202, MH 162, PA 210, PA 211, PA 212, PG 211, PG 212, PO 209, and SP 202. IE 204 is also recommended.

\*Ten hours are required in the same language. Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses. (For further information see page 242.)

**Curriculum in Pre-Veterinary Medicine (PV)**

The Pre-Veterinary Medicine curriculum at Auburn is open only to students who are bona fide residents of the State of Alabama under the Regional Plan of the Southern Regional Education Board. Minimum requirements for admission to the School of Veterinary Medicine are the first seven quarters as listed below (121 quarter hours).

**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
CH 103	Gen. Chem. & Lab.	.5	CH 104	Gen. Chem. & Lab.	.5	BI 101	Prins. Biol. & Lab.	.5
MH 160	Algebra & Trig.	.5	MH 161	Anal. Geom. & Cal. I	.5	CH 105	Gen. Chem. & Lab.	.5
EH 101	English Comp.	.3	EH 102	English Comp.	.3	EH 103	English Comp.	.3
HY 101	World History	.3	HY 102	World History	.3	HY 103	World History	.3
	Basic ROTC	.1		Basic ROTC	.1		Basic ROTC	.1
PE	Physical Education	.1	PE	Physical Education	.1	PE	Physical Education	.1

**SOPHOMORE YEAR**

BI 103	Prins. Anim. Biol. & Lab.	.5	AH 204	Anim. Biochem. & Nut.	.5	PO 209	American Govt.	.5
CH 207	Organic Chemistry	.5	CH 208	Organic Chemistry	.5		Group I Elective	.5
PS 205	Intr. Physics	.5	PS 206	Intr. Physics	.5		Group I Elective	.5
HY 205	Current Events	.1	HY 205	Current Events	.1	HY 205	Current Events	.1
	Basic ROTC	.1		Basic ROTC	.1		Basic ROTC	.1

Women students will take PE 111-112-113 Health Science in the freshman year and electives in the sophomore year in lieu of ROTC.

**JUNIOR YEAR**

ZY 300	Genetics	.5	CH 204	An. Chem. I & Lab.	.5	CH 316	Phys. Chem. & Lab.	.5
	Group I Elective*	.5	FL II	Foreign Language	.5	FL III	Foreign Language	.5
AH 302	Feed and Feeding	.3	PS 210	Modern Physics	.5		Group II Elective	.5
EH 141	Medical Vocabulary	.3		Group III Elective	.3		Group III Elective	.3

Group I Electives: These electives must be earned in humanities and fine arts, and the social sciences to meet the Liberal Educational requirements of the University.

Group II Electives: AH 200, AS 361, CH 204, CH 205, CH 209, CH 316, EC 200, MN 341, MN 342, EH 253, EH 254, EH 255, EH 350, EH 357, EH 358, EH 390, \*FL (15 hours), HY 201, HY 202, MH 163, MH 264, PA 202, PA 210, PA 211, PA 212, PH 301, PG 211, PG 212, PO 210 or PO 309 or PO 325, PS 210, SP 202, SY 201, SY 203, VM 200, ZY 404.

Group III Electives: These electives are to be chosen from courses offered by the following departments: AR, BY, DR, EC, EH, GY, HY, MU, PA, PG, PS, SP, SY, and ZY. EED 310 may also be taken.

### Degree Options

Students in PV may obtain a Bachelor of Science degree by completing the first nine quarters of this curriculum plus: (1) successfully completing the freshman year of Veterinary School; or (2) forty hours of Group II Electives and nine hours of Group III Electives; or (3) completing the requirements for a major\*\* selected from those listed below. Options (2) and (3) must add up to a total of 207 quarter hours.

## Majors and Symbols in the Pre-Veterinary Medicine Curriculum

### PV — Major Undeclared

VEC—Economics  
VEH—English  
VGY—Geography  
VJM—Journalism  
VFL—Foreign Language  
VHY—History

VMH—Mathematics  
VPO—Political Science  
VPA—Philosophy  
VSP—Speech  
VSU—Sociology

The Pre-Veterinary Medicine Advisers will guide students regarding matters relating to preparation for admission to veterinary school, and if he declares a major, the department in which he majors will guide him in his major work.

Applications for admission to the School of Veterinary Medicine must be submitted to the Dean of that school by February 15 preceding the admission date. A minimum grade point average of 1.25 is required for admission; D grades in required academic courses are not acceptable. All course requirements must be completed by the end of the spring quarter preceding the date of admission. (For further information, see School of Veterinary Medicine on page 165.)

\*A student in PV pursuing the BS degree will take the first course of the 15-hour requirement in a single foreign language here. Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses. (For further information, see page 242.)

\*\*See "Special Requirements for Departmental Majors" on page 95.

## Special Curricula

### Curriculum in Chemistry (CH)

#### FRESHMAN YEAR

##### First Quarter

CH 111 General Chemistry	5
MH 161 Anal. Geom. & Cal. I	5
EH 101 English Comp.	3
HY 101 World History	3
Basic ROTC	1

##### Second Quarter

CH 112 General Chemistry	5
MH 162 Anal. Geom. & Cal. II	5
EH 102 English Comp.	3
HY 102 World History	3
Basic ROTC	1

##### Third Quarter

CH 113 General Chemistry	5
MH 163 Anal. Geom. & Cal. III	5
EH 103 English Comp.	3
HY 103 World History	3
Basic ROTC	1

## SOPHOMORE YEAR

## First Quarter

CH 204	Anal. Chem. & Lab.	.5
MH 264	Anal. Geom. & Cal. IV	.5
PS 201	Physics I	.5
PE	Physical Education	.1

## Second Quarter

CH 205	Anal. Chem. & Lab.	.5
PS 202	Physics II	.5
MH 265	Linear Diff. Equa.	.3
PE	Physical Education	.1

## Third Quarter

CH 303	Organic Chemistry	.5
PS 203	Physics III	.5
MH 266	Topics in Lin. Alg.	.3
PE	Physical Education	.1

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

## JUNIOR YEAR

CH 304	Organic Chemistry	.5
CH 407	Physical Chemistry	.5
FL 1	German*	.5
CH 305	Organic Chemistry	.5
CH 408	Physical Chemistry	.5
FL 11	German*	.5

## SENIOR YEAR

CH 404	Organic Anal. (Qual.)	.5
CH 410	Inter. Inorg. Chem.	.5
CH 411	Inter. Inorg. Chem.	.5
CH 412	Chem. Thermo-dynamics	.5
CH 413	Anal. Chemistry	.5
FL 111	German	.5
PS 305	Modern Physics	.5

A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as "Certified Graduates" when they have made up the electives for which advanced ROTC was substituted.

## Total - 205 quarter hours

## APPROVED ELECTIVES\*\*

EH 253	English Literature	.3
EH 254	English Literature	.3
EH 255	English Literature	.3
EH 350	Shakespeare's Greatest Plays	.3
EH 365	Southern Literature	.3
DR 313	Theatre Appreciation I	.3
MU 373	Appreciation of Music	.3
MU 374	Masterpieces of Music	.3
HY 201	History of U.S.	.5
HY 202	History of U.S.	.5
PO 209	American Government	.5
EC 200	General Economics	.5
EC 206	Socio-Economic Foundation of Contemporary America	.3
GY 303	Geography of the Soviet Union	.3
SY 201	Introduction to Sociology	.5
PG 211	Psychology I	.3

\*Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses. (See page 242.)

\*\*EC 200, PO 209, or SY 201 must be included among these electives.

Alternate Curriculum in Chemistry (CH)  
(Biochemistry Option)

## FRESHMAN YEAR

## First Quarter

CH 111	General Chemistry	.5
MH 161	Anal. Geom. & Cal. I	.5
EH 101	English Comp.	.3
HY 101	World History	.3
PE	Physical Education	.1

## Second Quarter

CH 112	General Chemistry	.5
MH 162	Anal. Geom. & Cal. II	.5
EH 102	English Comp.	.3
HY 102	World History	.3
PE	Physical Education	.1

## Third Quarter

CH 113	General Chemistry	.5
MH 163	Anal. Geom. & Cal. III	.5
EH 103	English Comp.	.3
HY 103	World History	.3
PE	Physical Education	.1

## SOPHOMORE YEAR

CH 204	Anal. Chem. & Lab.	.5
MH 264	Anal. Geom. & Cal. IV	.5
PS 201	Physics I	.5
CH 205	Anal. Chem. & Lab.	.5
PS 202	Physics II	.5
MH 265	Linear Diff. Equat.	.3
BI 101	Prins. of Biol. & Lab.	.5
CH 303	Organic Chemistry	.5
PS 203	Physics III	.5

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

## JUNIOR YEAR

BI 103	Gen. Anim. Biol. & Lab.	.5
CH 304	Organic Chemistry	.5
CH 407	Physical Chemistry	.5
CH 305	Organic Chemistry	.5
CH 408	Physical Chemistry	.5
ZY 301	Compara. Anatomy	.5
CH 409	Physical Chemistry	.5
VM 200	Gen. Microbiology	.5
ZY 424	Animal Physiology	.5



## SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
CH 418 Biochemistry	5	CH 419 Biochemistry	5	CH 420 Biochemistry	5
FL I German*	5	FL II German*	5	FL III German	5
EH 390 Adv. Composition	5	Elective**	3-5	Elective	3-5
Elective	3	Elective	3	Elective	3

A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as "Certified Graduates" when they have made up the electives for which advanced ROTC was substituted.

## Total — 207 quarter hours

## APPROVED ELECTIVES\*\*

EH 253 English Literature	3	HY 201 History of U.S.	5
EH 254 English Literature	3	HY 202 History of U.S.	5
EH 255 English Literature	3	PO 209 American Government	5
EH 350 Shakespeare's Greatest Plays	3	EC 200 General Economics	5
EH 365 Southern Literature	3	EC 206 Socio-Economic Foundations of Contemporary America	3
DR 313 Theatre Appreciation I	3	GY 303 Geography of the Soviet Union	3
MU 373 Appreciation of Music	3	SY 201 Introduction to Sociology	5
MU 374 Masterpieces of Music	3	PG 211 Psychology I	3

\*Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses (See page 242.)

\*\*EC 200, PO 209, or SY 201 must be included among these electives.

## Curriculum in Geology (GL)

The rapidly expanding awareness of their needs for the services of geologists or geoscientists by Federal, state, and municipal agencies, colleges and universities, and private agencies and industries has created a diversified demand for the individual trained in geology. A demand for teachers with a geologic background has been created by the introduction of geoscience subject matter in the elementary and secondary public schools. In addition, the growing interdependence of the scientific disciplines, some fields of law, and other specialties suggests that an adequate background in geology be obtained by many students to meet the needs imposed by their professional careers after graduation.

Although the demand for geologists with a bachelor's degree in geology is presently high, it is in the best interests of the student planning a career as a professional geologist to seriously consider the merits of further study and specialization in graduate school. Although the curriculum in geology at Auburn University is flexible enough to allow adequate sampling of courses by the non-major, or selection of a minor or double minor, it primarily provides the student with a broad, fundamental knowledge of geological principles and sufficient background in related sciences to allow intelligent selection of employment or specialization in graduate school with a minimum of deficiencies.

The following four-year curriculum satisfies the requirements for graduation with a Bachelor of Science degree in geology. A minor in geology consists of (1) GL 301, GL 302, and either GL 401, GL 402, or GL 403, or (2) GL 311, GL 312, and GL 401. A double minor consists of GL 301, GL 302, GL 401, GL 402, GL 403, and either GL 421 or GL 422.

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
GL 101	Intr. Geology I . . . . .5	GL 102	Intr. Geology II . . . . .5	GL 103	Historical Geology . . . . .5
MH 161	Anal. Geom. & Cal. I . . . . .5	MH 162	Anal. Geom. & Cal. II . . . . .5	MH 163	Anal. Geom. & Cal. III . . . . .5
EH 101	English Comp. . . . .3	EH 102	English Comp. . . . .3	EH 103	English Comp. . . . .3
HY 101	World History . . . . .3	HY 102	World History . . . . .3	HY 103	World History . . . . .3
PE	Basic ROTC . . . . .1	PE	Basic ROTC . . . . .1	PE	Basic ROTC . . . . .1
PE	Physical Education . . . . .1	PE	Physical Education . . . . .1	PE	Physical Education . . . . .1

## SOPHOMORE YEAR

CH 111	General Chemistry * . . . .5	BI	Biology** . . . . .5	BI	Biology** . . . . .5
MH 264	Anal. Geom. & Cal. IV . . . . .5	CH 112	General Chemistry* . . . .5	CH 113	General Chemistry . . . . .5
PS 201	Physics I . . . . .5	PS 202	Physics II . . . . .5	PS 203	Physics III . . . . .5
	Basic ROTC . . . . .1	GL 201	Geol. Field Methods . . . .2		Basic ROTC . . . . .1
			Basic ROTC . . . . .1		

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

## JUNIOR YEAR

GL 301	Mineralogy I . . . . .5	GL 302	Mineralogy II . . . . .5		Minor . . . . .5
GL 311	Paleozoology . . . . .5	GL 312	Paleobotany . . . . .5		Minor . . . . .5
PO 209	American Govt. . . . .5	PO 210	State Govt. . . . .5	EH 255	English Literature . . . . .3
EH 253	English Literature . . . . .3	EH 254	English Literature . . . . .3		Group Elective . . . . .3-5

## SENIOR YEAR

GL 401	Sed.-Sed. Pet. . . . .5	GL 402	Str.-Met. Pet. . . . .5	GL 403	Ing. Gl. & Pet. . . . .5
	Minor . . . . .5		Minor . . . . .5	GL 411	Stratigraphy . . . . .5
	Minor . . . . .5		Minor . . . . .5		Group Elective . . . . .3-5
	Group Elective . . . . .3-5				Group Elective . . . . .3-5

## Total - 207 quarter hours

Minors: Two 15-hour minor sequences (or one 30-hour double minor sequence) should be completed from courses, 200 level or above, offered by the departments of Agronomy and Soils, Botany, Chemistry, Mathematics, Physics, and/or Zoology. Consent of the student's major adviser is required before a minor sequence is attempted.

Group Electives: A total of 14 quarter hours of electives must be chosen from three- or five-hour courses offered by the departments of Economics, Foreign Languages\*\*, Geography, History, Journalism, Philosophy, Political Science, Psychology, Sociology, or Speech.

\*The (15-hour) sequence CH 103-104-105 (with appropriate labs) may be substituted for the CH 111-112-113 sequence.

\*\*Either the sequence BI 101-102, or the sequence BI 101-103, may be chosen to fulfill the Biological Science requirement.

\*\*\*Fifteen hours are required in the same language. Students who have satisfactorily completed two years of foreign language in high school should begin that language at the intermediate level; college credit is not normally granted in such cases in elementary level courses.

## Laboratory Technology (LT)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101	Prins. of Biol. & Lab. . . . .5	BI 103	Gen. Anim. Biol. & Lab. . . . .5	CH 105	Gen. Chem. & Lab. . . . .5
CH 103	Gen. Chem. & Lab. . . . .5	CH 104	Gen. Chem. & Lab. . . . .5	MH 161	Anal. Geom. & Cal. I . . . . .5
MH 159	Precalculus Math. . . . .5	EH 101	English Comp. . . . .3	EH 102	English Comp. . . . .3
LT 101	Orientation . . . . .1	PE 110	Health Science . . . . .3	HY 205	Current Events . . . . .1
PE	Physical Education . . . . .1	PE	Physical Education . . . . .1	PE	Physical Education . . . . .1

## SOPHOMORE YEAR

CH 207	Organic Chemistry . . . . .5	CH 208	Organic Chemistry . . . . .5	CH 204	Anal. Chem. & Lab. . . . .5
PS 205	Intr. Physics . . . . .5	PS 206	Intr. Physics . . . . .5	VM 200	Gen. Microbiology . . . . .5
EH 103	English Comp. . . . .3	VM 220	Human Anat. & Physiol. . . . .5	VM 221	Human Anat. & Physiol. . . . .5
HY 205	Current Events . . . . .1	EH 141	Med. Vocabulary . . . . .3	HY 205	Current Events . . . . .1

Men students will take six quarters of Basic ROTC during the freshman and sophomore years in lieu of PE 110 Health Science and HY 205 Current Events.

## JUNIOR YEAR

CH 418	Biochemistry . . . . .5	CH 419	Biochemistry . . . . .5	CH 420	Biochemistry . . . . .5
LT 301	Hematology . . . . .5	LT 305	Serology . . . . .5	LT 401	Adv. Hematology . . . . .5
VM 204	Path. Microbiology . . . . .5	ZY 411	Gen. Parasitology . . . . .5		Elective* . . . . .5
HY 101	World History . . . . .3	HY 102	World History . . . . .3	HY 103	World History . . . . .3

## SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
ZY 308	Micrology . . . . . 5	PY 428	Public Health . . . . . 5	LT 405	Adv. Serology . . . . . 5
EH 345	Bus. & Prof. . . . . 5	SP 202	App. Oral Commun. 3	LT 422	Hosp. Lab. Practice 5
	Writing . . . . . 5		Electives . . . . . 10	ZY 409	Histology . . . . . 5
	Elective . . . . . 5				
LT 402	Seminar . . . . . 3				

## Total — 205 quarter hours

## APPROVED ELECTIVES\*

EH 253	English Literature . . . . . 3	HY 201	History of U.S. . . . . 5
EH 254	English Literature . . . . . 3	HY 202	History of U.S. . . . . 5
EH 255	English Literature . . . . . 3	PO 209	American Government . . . . . 5
EH 350	Shakespeare's Greatest Plays . . . . . 3	EC 200	General Economics . . . . . 5
EH 365	Southern Literature . . . . . 3	EC 206	Socio-Economic Foundations of Contemporary America . . . . . 3
DR 313	Theatre Appreciation I . . . . . 3	GY 303	Geography of the Soviet Union . . . . . 3
MU 373	Appreciation of Music . . . . . 3	SY 201	Introduction to Sociology . . . . . 5
MU 374	Masterpieces of Music . . . . . 3	PG 211	Psychology I . . . . . 3

\*EC 200, PO 209, or SY 201 must be included among these electives.

## Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians.

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL 1	Foreign Language* . . . . . 5	FL 11	Foreign Language . . . . . 5	FL III	Foreign Language . . . . . 5
MH 161	Anal. Geom. & Cal. I . . . . . 5	MH 162	Anal. Geom. & Cal. II . . . . . 5	MH 163	Anal. Geom. & Cal. III . . . . . 5
EH 101	English Comp. . . . . 3	EH 102	English Comp. . . . . 3	EH 103	English Comp. . . . . 3
HY 101	World History . . . . . 3	HY 102	World History . . . . . 3	HY 103	World History . . . . . 3
	Basic ROTC . . . . . 1		Basic ROTC . . . . . 1		Basic ROTC . . . . . 1

## SOPHOMORE YEAR

MH 220	Intr. Analysis I** . . . . . 5	MH 221	Intr. Analysis II . . . . . 5	MH 222	Intr. Analysis III . . . . . 5
	Natural Science*** . . . . . 5		Natural Science . . . . . 5		Natural Science . . . . . 5
EH 253	English Literature . . . . . 3	EH 254	English Literature . . . . . 3	EH 255	English Literature . . . . . 3
	Basic ROTC . . . . . 1		Basic ROTC . . . . . 1		Basic ROTC . . . . . 1
PE	Physical Education . . . . . 1	PE	Physical Education . . . . . 1	PE	Physical Education . . . . . 1

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

## JUNIOR YEAR

FL 1	Foreign Language* . . . . . 5	FL II	Foreign Language . . . . . 5	FL III	Foreign Language . . . . . 5
MH 331	Intr. Mod. Algebra I . . . . . 5	MH 332	Intr. Mod. Algebra II . . . . . 5	MH 333	Intr. Mod. Algebra III . . . . . 5
MH 428	Lin. Diff. Systems . . . . . 5		Group I . . . . . 5		Group I Elective . . . . . 5
	Elective . . . . . 3		Elective**** . . . . . 5		Elective . . . . . 3
			Elective . . . . . 3		

## SENIOR YEAR

MH 443	Lin. Geom. or	MH	Elective . . . . . 5	MH	Elective . . . . . 5
MH 444	Comb. Geom. Pl. or		Elective . . . . . 5		Elective . . . . . 5
MH 447	Found. Geom. . . . . 5		Elective . . . . . 5		Elective . . . . . 5
	Elective . . . . . 5				
	Elective . . . . . 5				

## Total — 195 quarter hours

\*The foreign language requirement may be met by (1) passing 15 hours (3 courses) in each of two of the languages French, German, and Russian, or (2) passing 30 hours (6 courses) in one of these three languages. If a student chooses the latter option he may, for the sake of continuity, interchange the sophomore natural science sequence and the junior foreign language sequence. Students who have satisfactorily completed two years of a foreign language sequence in high school and who wish to continue with that language should begin their university work at the 200 level. In such cases college credit is normally not granted for 100-level courses.

\*\*Transfer students who have had as much as 20 quarter hours of analytical geometry and calculus may take MH 420-21-22 in lieu of MH 220-21-22.

\*\*\*The natural science requirement may be met by taking PS 201, PS 202 and PS 203, or CH 111, CH 412 and CH 113.

\*\*\*\*Group I electives must be in one of the following areas of social science: economics, education, history, political science, psychology, or sociology. All other electives may be used to meet the needs and interests of individual students. A student will decide upon appropriate courses in consultation with his departmental adviser.

## Curriculum in Physics (PS)

The significant role of physics in the development and advancement of modern science is seen in the continual demand for scientists with outstanding preparation in the field. Opportunities for a rewarding career in this field are found in industrial and governmental laboratories in both pure and applied research. In addition, the continued increase in college and university enrollments will provide excellent opportunities for persons in the field desiring a career in teaching and/or research at the college or university level in higher education.

The curriculum in Physics provides a fundamental preparation for persons pursuing a career in the areas described above. It also provides an excellent foundation for persons seeking to pursue graduate work in physics.

An outstanding feature of the curriculum is the research participation during the senior year wherein an investigation of one or more basic experimental problems is undertaken in conjunction with the research group of a member of the senior staff of the department. Excellent laboratory and library facilities are available for use in support of the analytical and experimental problems which the student would encounter.

Inquisitive students with exceptional abilities in mathematics and physical science and special aptitudes for research will find the Physics curriculum a challenging inducement to test their competence and to strive for high goals of attainment.

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
CH 103 Gen. Chem. _____	CH 104 Gen. Chem. _____	MH 163 Anal. Geom. _____
& Lab. I _____ 5	& Lab. II _____ 5	& Cal. III _____ 5
MH 161 Anal. Geom. _____	MH 162 Anal. Geom. _____	PS 220 Gen. Physics I _____ 4
& Cal. I* _____ 5	& Cal. II _____ 5	EH 103 English Comp. _____ 3
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	HY 102 World History _____ 3
Basic ROTC _____ 1	HY 101 World History _____ 3	Basic ROTC _____ 1
PE Physical Education _____ 1	Basic ROTC _____ 1	PE Physical Education _____ 1
	PE Physical Education _____ 1	
SOPHOMORE YEAR		
MH 264 Anal. Geom. _____	FL I German** _____ 5	FL II German _____ 5
& Cal. IV _____ 5	Social Science _____ 5	PS 305 Intr. Mod. Physics _____ 5
PS 221 Gen. Physics II _____ 4	Elect. _____ 5	MH 266 Topics Linear _____ 3
HY 103 World History _____ 3	PS 222 Gen. Physics III _____ 4	Algebra _____ 3
PS 217 Astronomy _____ 3	MH 265 Lin. Diff. _____ 3	PS 340 Inter. Mechanics _____ 3
Basic ROTC _____ 1	Equations _____ 3	Basic ROTC _____ 1
	Basic ROTC _____ 1	
Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.		
JUNIOR YEAR		
FL III German _____ 5	MH 406 Elem. Partial D.E. _____ 5	PS 303 Optics _____ 5
PS 300 Inter. Elec. _____ 4	PS 302 Electronics _____ 5	Group Electives _____ 10
& Mag. I _____ 4	PS 301 Inter. Elect. _____ 4	Elective _____ 3
Elective _____ 5	& Mag. II _____ 4	
MH 401 Cal. Vector Funct. _____ 3	Elective _____ 3	
SENIOR YEAR		
PS 401 Theor. Physics I _____ 5	PS 402 Theor. Physics II _____ 5	PS 404 Thermodynamics _____ 5
PS 415 Mod. Physics I _____ 5	PS 416 Mod. Physics II _____ 5	Physics Elective*** _____ 5
Electives _____ 8	PS 406 Adv. Lab. I _____ 2	PS 407 Adv. Lab. II _____ 2
	Electives _____ 6	Electives _____ 6

Total — 207 quarter hours

\*Students not prepared for MH 161 must take MH 160 without credit.

\*\*Three quarter sequences in French or Russian may be substituted. Fifteen hours are required in the same language. Students who have satisfactorily completed two years of a foreign language in high school should begin that language at the intermediate level; for such cases college credit is not normally granted in elementary level courses. (See page 242.)

\*\*\*Either PS 405 or PS 435 must be elected.

## GROUP ELECTIVES

CH 204 Analytical Chemistry I & Lab.****	PS 403 Theoretical Physics III
CH 407 Physical Chemistry	PS 405 Nuclear Physics
CH 408 Physical Chemistry	PS 408 Advanced Laboratory III
GL 301 Mineralogy I	PS 409 Intr. to Reactor Physics I
GL 302 Mineralogy II	PS 410 Intr. to Reactor Physics II
GL 401 Sedimen.-Sed. Petrology	PS 412 Seminar in Modern Physics
GL 402 Stret. Geology Met. Petrology	PS 413 Intr. to X-ray Crystallography
GL 403 Igneous Geology & Petrology	PS 414 Electron Optics & Microscopy
MH 403 Engr. Math. II	PS 417 Intr. to Biophysics
MH 405 Matrix Theory Applications	PS 421 Modern Electronics
MH 407 Intr. to Celestial Mech.	PS 435 Intr. to Solid State
MH 460 Numerical Analysis I	PS 470 Health Physics
PS 304 Applied Spectroscopy	

\*\*\*\*Credit for CH 204 allowed only if CH 407 and CH 408 are completed.

## Curriculum in Applied Physics (APS)

This curriculum, like that in Physics, provides a solid foundation in physics. In addition, it emphasizes related technical fields to provide a broader base for persons who desire to enter industrial and governmental research laboratories following receipt of the undergraduate degree. Persons wishing to pursue graduate work will find this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group I Electives. These are to be chosen from one of the following areas: chemistry, geology, aerospace, electrical or mechanical engineering. Students anticipating graduate work should complete at least 15 hours in a foreign language: French, German, or Russian.

## FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
CH 103 Gen. Chem. & Lab.*.5	CH 104 Gen. Chem. & Lab. .5	MH 163 Anal. Geom. & Cal. III .5
MH 161 Anal. Geom. & Cal. I** .5	MH 162 Anal. Geom. & Cal. II .5	PS 220 Gen. Physics I .4
EH 101 English Comp. .3	EH 102 English Comp. .3	EH 103 English Comp. .3
Basic ROTC .1	HY 101 World History .3	HY 102 World History .3
PE Physical Education .1	Basic ROTC .1	Basic ROTC .1
	PE Physical Education .1	PE Physical Education .1

## SOPHOMORE YEAR

MH 264 Anal. Geom. & Cal. IV .5	ME 321 Dyn. of a Particle .4	EE 263 Circuit Analysis I .5
ME 205 Appl. Mech.-Statics .4	PS 222 Gen. Physics III .4	PS 305 Intr. to Mod. Physics .5
PS 221 Gen. Physics II .4	MH 265 Lin. Diff. Equations .3	Group I Elective .5
HY 103 World History .3	MH 266 Top Lin. Algebra .3	EG 102 Eng. Drawing .2
IL 103 Tool Lab. .1	Group II Elective .3	Basic ROTC .1
Basic ROTC .1	Basic ROTC .1	

Women students will take PE 111-112-113 Health Science in the freshman year and three quarters of HY 205 Current Events in the sophomore year in lieu of ROTC.

## JUNIOR YEAR

Group I Elective .5	MH 406 Elem. Partial D.E. .5	PS 303 Optics .5
PS 300 Inter. Elec. & Mag. I .4	PS 302 Electronics .5	PS 421 Modern Electricity .5
MH 401 Calculus Vect. Funct. .3	PS 301 Inter. Elec. & Mag. II .4	Group I Elective .5
PS 217 Astronomy .3	Group II Elective .3	Group II Elective .3

## SENIOR YEAR

PS 401 Theor. Physics I .5	PS 402 Theor. Physics II .5	PS 404 Thermodynamics .5
PS 415 Mod. Physics I .5	PS 416 Mod. Physics II .5	Physics Elective*** .5
Group I Elective .5	Group II Elective .5	Group II Electives .6
Group II Elective .3	PS 406 Adv. Lab. I .2	PS 407 Adv. Lab. II .2

## Total - 207 quarter hours

\*Students selecting chemistry for their specialization area (via Group I Electives) will take CH 111 and CH 112 instead of CH 103 and CH 104, and CH 113 instead of ME 205, CH 303 instead of ME 321, and CH 304 instead of EE 263.

\*\*Students not prepared for MH 161 must take MH 160 without credit.

\*\*\*Either PS 405 or PS 435 must be elected.

## GROUP I ELECTIVES

AE 302 Airloads .....	4	EE 361 Network Analysis .....	5
AE 303 Theor. Aerodynamics I .....	3	EE 362 Linear Systems .....	5
AE 304 Theor. Aerodynamics II .....	4	EE 373 Electronics III .....	5
AE 400 Viscous Aerodynamics .....	4	EE 472 Communications Theory .....	5
AE 414 Equilibrium Gasdynamics .....	3	GL 301 Mineralogy I .....	5
AE 415 Jet Propulsion .....	5	GL 302 Mineralogy II .....	5
AE 432 Astrodynamics I .....	3	GL 401 Sedimen.-Sed. Petrology .....	5
AE 433 Astrodynamics II .....	3	GL 402 Struct. Geology-Met. Petrology .....	5
CH 204 & Lab. Analytical Chemistry I**** .....	5	GL 403 Igneous Geology & Petrology .....	5
CH 305 Organic Chemistry .....	5	ME 208 Strength of Materials I .....	3
CH 407 Physical Chemistry .....	5	ME 322 Dynamics II .....	4
CH 408 Physical Chemistry .....	5	ME 335 Metallurgy .....	4
CH 409 Physical Chemistry .....	5	ME 340 Fluid Mech. I .....	3
CH 410 Inter. Inorganic Chemistry I .....	5	ME 341 Fluid Mech. II .....	4
CH 412 Chemical Thermodynamics .....	5	ME 421 Heat Transfer .....	4
EE 322 Logic & Computing Systems .....	3	ME 450 Special Problems .....	5

## GROUP II ELECTIVES

A minimum total of 23 hours of elective credit must be taken in the Social Sciences area and in the Humanities and Fine Arts area with at least one course in each of the two areas. Students anticipating pursuit of graduate study in physics should elect three quarters in a foreign language, preferably German, French, or Russian. Five of the remaining hours must then be taken in a social science.

\*\*\*\*Credit for CH 204 allowed only if CH 407 and CH 408 are completed.



# School of Business

O. D. TURNER, *Dean*

**T**HE SCHOOL OF BUSINESS offers four-year undergraduate programs leading to the Bachelor of Science degree. It offers graduate work leading to the degrees of Master of Science, Master of Business Administration and Master of Arts in College Teaching. The Graduate School Bulletin should be referred to for more detailed information about graduate programs.

## *Instruction*

Business graduates will be confronted with diverse challenges in their professional and personal lives — challenges resulting from rapid technological advances and the increasingly complex economic and social environment in which organizations operate. In order successfully to meet these challenges, the business graduate must have a broad, liberal education as well as specialized knowledge.

The fundamental objective of the School of Business is to prepare students for managerial leadership careers in business, industry and government. All programs are designed to assure a broad liberal education as well as opportunity to acquire a degree of specialized professional knowledge. All business students are required to take approximately half the total number of hours required for graduation in subject matter areas other than business.

Effective managerial leadership in modern organizations requires analytical, decision-making, and communications skills. The development of these skills is emphasized — to the extent possible — in all business courses.

## **Co-Operative Education Program**

A co-operative program is offered for business students which provides an opportunity to integrate academic training with business experience. For further information about this program, interested students should write to the Director, Co-Operative Education, 107 Ramsay Hall, Auburn University.

## **Curriculum**

The basic curriculum offered by the School of Business is a four-year one leading to the degree of Bachelor of Science. Within this curriculum several programs of study are available. These programs allow students to concentrate their studies during the junior and senior years in the areas of Accounting (AC), Economics (EC), Finance (FI), General Business (GB), Geography (GY), Industrial Management (INM), Marketing (MK), Office Administration (OA), Personnel Management and

Industrial Relations (PIR), Quantitative Methods (QM), and Transportation (TN).

By the third quarter of the sophomore year, each business student should choose the particular program of study which he, or she, intends to follow.

### Core Courses

With few exceptions all students in the School of Business must complete the following ten core courses:

ACF 211-212	Principles of Accounting I and II
EC 200-202	Economics I and II
EC 274	Business and Economic Statistics I
ACF 361	Principles of Business Finance
MT 331	Principles of Marketing
MN 310	Business Organization and Management
MN 341	Business Law I
MN 480	Business Policies and Administration

## The Lower Division Curriculum

The Lower Division Curriculum is a two-year program of studies for business students during the freshman and sophomore years. It provides a broad, liberal educational foundation preparatory to more intensive study of functional areas of business and their interrelationships and interdependencies.

The Lower Division Curriculum is uniform, except for the Geography and Office Administration curricula.

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 Eng. Comp. _____ 3	EH 102 Eng. Comp. _____ 3	EH 103 Eng. Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	HY 103 World History _____ 3
*MH 160 Algebra & Trig. _____ 5	MH 161 Anal. Geom. & Cal. _____ 5	Math/Sci. Elect. _____ 5
**Science _____ 5	**Science _____ 5	***Elective _____ 5
MS Military Science _____ 1	MS Military Science _____ 1	MS Military Science _____ 1
PE Physical Education _____ 1	PE Physical Education _____ 1	PE Physical Education _____ 1
SOPHOMORE YEAR		
ACF 211 Intr. Acct. _____ 5	ACF 212 Intr. Acct. _____ 5	EC 274 Bus. & Econ. Stat. I _____ 3
IE 301 Elec. Data Pro. _____ 5	EC 200 Economics I _____ 5	EC 202 Economics II _____ 5
***MN 200 Typewriting I _____ 3	PG 211 Psychology _____ 3	Elective _____ 3
Elective _____ 3	Elective _____ 3	SP 202 Ap. Oral Comm. _____ 3
MS Military Science _____ 1	MS Military Science _____ 1	MS Military Science _____ 1

Women students will take Hygiene in the Freshman year and current events in the Sophomore year in lieu of Military Training.

\*Or MH 159, according to placement scores.

\*\*A science series of at least ten hours is required. Possible courses are: CH 101-102-104 or CH 103-104; BI 101-102 or 101-102-103; PS 220-221-232 or PS 205-206; GL 101-102; ZY 101-102.

\*\*\*Electives may be from any area, subject to departmental requirements. During the four years of study a minimum of 83 hours must be taken in Business and Economics and a minimum of 83 hours taken in non-business subjects. The remaining 41 hours may be from any area. The non-business subjects must include a minimum of 20 quarter hours in (a) humanities and fine arts and (b) mathematics-natural science electives in addition to the Freshman requirements. At least one course must be taken in each category.

\*\*\*\*Students who have high school credit in typing or can pass a proficiency test are not required to take typing.

## The Upper Division Curriculum

Programs have been developed by the departments of the School of Business to guide students in their junior and senior years. These programs include, in addition to the core courses, the requirements for concentrations in the different areas within the School. For the detailed

requirements of these programs, consult the appropriate departmental offices in the School of Business.

The School of Business contains four departments: Accounting and Finance; Management; Marketing and Transportation; and Economics and Geography. Each department has one or more areas of concentration, as described below.

## Accounting and Finance

**Accounting.** The program provides broad training in the field of business and financial management. The student is required to take seven basic accounting courses, and can elect other courses to provide an emphasis in a particular field of managerial or public accounting.

**Finance.** The finance option offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are included.

## Economics and Geography

**Economics.** Businessmen, public officials and educators are developing a greater appreciation of the role which economists can play in making crucial decisions. For students who wish to prepare for active participation in the decision-making process, the economics concentration offered by the School of Business provides a valuable foundation.

**Geography.** The curriculum in Geography prepares students to serve a vital role in different agencies of the federal, state and local governments, in private business and in teaching. Agencies which find training in geography of especial value include the Geological Survey, the Forestry Service, the State Department, the Census Bureau, and the National Park Service, as well as city and state boards of industrial planning. Geographers assist private businesses in plant location, marketing research, and resource location and development. Geography teachers are in demand at both the high school and college levels.

After completing the first year of course work required of all students in the School of Business, students concentrating in Geography will take the following work in their sophomore year:

SOPHOMORE YEAR					
First Quarter		Second Quarter		Third Quarter	
GY 105 Econ. Geog.	5	EC 200 Economics I	5	EC 202 Economics II	5
ACF 211 Intr. Acct.	5	ACF 212 Intr. Acct.	5	IE 301 Elec. Data Pro.	5
MN 200 Typewriting I	3	GY 201 Weather & Cl.	5	GY 301 Geo. Pol. W. Pow.	3
Elective	3	MS Military Science	1	SP 202 Ap. Oral Comm.	3
MS Military Science	1			MS Military Science	1

During their junior and senior years, students follow, with the guidance of their advisers, a specialized program in geography with options in business, economics, and planning.

**Quantitative Methods.** This program is designed for students who wish to specialize in the statistical and quantitative areas of management such as business forecasting and quality control.

## Marketing and Transportation

A student may elect to concentrate his work in either marketing, transportation, or a combination of the two. The marketing program is

designed to prepare students for positions in sales, advertising, marketing research, and marketing management. The transportation program is recommended for students who desire to prepare for positions with the air, bus, pipeline, railroad, steamship, or trucking industries, as well as traffic management departments of industrial concerns and regulatory bodies.

## Management

### Areas of Concentration

**General Business.** The general business program is for students who do not wish to specialize in a specific area. It requires a minimum of courses in the School of Business and leaves the student free to select a large number of courses through electives from other departments in the University. One completing this program should have a broad general education.

**Industrial Management.** The industrial management program is for students who wish to specialize in the management of industrial organizations. It requires study in work standards, production control, computer applications, quantitative methods, human relations, management, and the utilization of these studies in management decision-making. Also, the student is permitted some free electives which he may use to study areas outside the School of Business.

**Personnel and Industrial Relations Management.** The personnel and industrial relations program is designed to develop graduates capable of managing the personnel and industrial relations activities of various types of organizations. It blends studies in the areas of psychology, sociology, labor, industrial relations, and personnel management activities, into decision making patterns for the organization's dealings with individual employees and unions. In addition, the program provides some free electives that the student may use to pursue studies of personal interest.

**Office Administration.** The Office Administration program is for students who plan to become secretaries or administrative assistants in business, government, or professional offices.

### Office Administration (OA)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MH 159	Mathematics	5	MH 161	Mathematics	5		Science	5
PE 110	Health Science	3		Science	5	MN 200	Typewriting I	3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1
			SOPHOMORE YEAR					
EC 200	Economics I	5	ACF 211	Intr. Acct.	5	ACF 212	Intr. Acct.	5
MN 210	Shorthand I	5	MN 211	Shorthand II	5	MN 212	Shorthand III	5
MN 201	Typewriting II	3	MN 202	Typewriting III	3	MN 203	Typewriting IV	2
	Elective	3	SP 202	Ap. Oral Com.	3		Elective	5

# School of Education

TRUMAN M. PIERCE, *Dean*  
ROBERT L. SAUNDERS, *Assistant Dean*

**T**HE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary teachers and school service personnel with the doctor's degree as the highest degree approved.

Professional preparation programs are provided for service in the fields of curriculum and teaching; administration, supervision, and guidance. Since school service is a profession with various areas of activity, the School of Education provides training in specialized curricula on both the undergraduate and graduate levels. Undergraduate programs lead to the degree of Bachelor of Science in Education. Programs administered by the Graduate School lead to the degrees of Master of Education, the Master of Science, Specialist in Education, and Doctor of Education.

## *Programs and Degrees*

### **Undergraduate**

**The Department of Elementary Education** prepares teachers for elementary schools. This curriculum leads to the degree of Bachelor of Science in Education and includes study in the liberal arts, psychology, educational theory and practice, laboratory experiences, and provision for concentration of study in special education, early childhood education, speech correction, or a subject-matter field.

**The Department of Foundations of Education** provides a service function within the School of Education. Undergraduate and graduate courses which relate to the total educational enterprise and which are ordinarily included in the program of study of all students in teacher education are offered through this department. Courses in human development, educational psychology, philosophy, sociology and history of education, and research and experimentation are offered.

**The Department of Health, Physical Education, and Recreation** prepares teachers of health and physical education for grades one through twelve. This curriculum leads to the degree of Bachelor of Science in Education and includes study in the liberal arts, psychology, educational theory and practice, laboratory experiences, and specialization in health, physical education and recreation.

**The Department of Secondary Education** prepares secondary school teachers. This curriculum leads to the degree of Bachelor of Science in Education and includes study in the liberal arts, specialization in a major and minor teaching field, psychology, educational theory and

practice, and laboratory experiences. Specialization in teaching fields include Art, Business Education, Theatre, English, Foreign Languages, Home Economics, Mathematics, Music, Science, School Library Science, Social Science, Speech, and Speech Correction.

**The Department of Vocational, Technical, and Practical Arts Education** prepares professional personnel in one of the following fields of specialization in vocational and technical education: adult education, agricultural education, basic vocational education, distributive education, industrial arts education, rehabilitation services education, and trade and industrial education. These programs lead to the degree of Bachelor of Science in Education. Curricula include study in liberal arts, psychology, educational theory and practice, laboratory experiences, and in one of the above fields of specialization. All curricula require a common core in professional and vocational education.

## **Dual Objectives Program**

Students who are enrolled in Schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete requirements of the Teacher Education Program may pursue the Dual Objectives Program.

A student electing to pursue the dual objectives program will have an adviser in the academic department in which he is enrolled and an adviser in the School of Education. Advising the student concerning the curriculum of the academic department, including the major, minor and other requirements, will be the responsibility of the adviser in that department. The responsibility for advising the student on matters concerning the Teacher Education Program will be that of the adviser in the School of Education. The quarterly course schedule of the student will be approved by both advisers. Information describing the Dual Objectives Program is available in the Student Personnel Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the student is enrolled.

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Student Personnel Office in Haley Center.

## **Graduate**

Graduate programs are offered through the Graduate School in administration, supervision, and guidance; vocational, technical and practical arts education; elementary education; health, physical education and recreation; and secondary education. A graduate program is also available in school library service.

Fifth-year programs of study in these areas lead to the degrees of Master of Science and Master of Education.

Sixth-year programs in curriculum and teaching, and in administration, supervision, and guidance lead to the degree of Specialist in Education.

A program leading to the degree of Doctor of Education is offered with areas of specialization in Counselor Education, Educational Ad-



ministration and Supervision, Elementary Education, and Secondary Education. Specializations in Secondary Education include the following sub-specializations: (a) Business Education, (b) Language Arts Education, (c) Mathematics Education, (d) Science Education, and (e) Social Sciences Education. See Graduate School Bulletin.

Programs leading to the degrees of Master of Education, Master of Science in Education, Specialist in Education, and Doctor of Education are offered for junior college administrators, student personnel administrators and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs. Course guides for each of the various programs are available in the Office of the Dean of Education.

## *Related Programs and Services*

### **Teacher Certification Services**

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education and the Alabama State Board of Education for certifying superintendents, supervisors, principals, guidance personnel, elementary and secondary teachers, and school librarians. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students who are enrolled in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete requirements of the Teacher Education Program may pursue the Dual Objectives Program. See page 116. Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

For detailed requirements for the Professional Certificate (Ranks B, A, or AA), Emergency Professional, and Trades and Industries Certificates, consult the Alabama State Department of Education Bulletin 1966, No. 14, available in the office of the Dean of the School of Education.

### **Student Personnel Services**

*Virada K. Schuessler, Coordinator*

The Student Personnel Services Program of the School of Education assists the student in understanding the University and becoming a part of it, in identifying his strengths and limitations, in determining his professional goals, in selecting the proper curriculum in the University, and in securing employment upon graduation.

**Recruitment.** — Able young people are encouraged to consider teaching as a profession. Efforts of organizations such as the Future Teachers of America in the secondary schools and the Student National Education Association in colleges and of individuals and groups in the profession are aimed at seeking out, informing, and encouraging students.

**Financial Aid.** — Opportunities for financial aid are available in part-time employment and loans. One type of loan, the Student Loan Program financed by the National Defense Education Act, provides low-interest, long-term loan funds that are particularly attractive to School of Education students because of special provision for the prospective public school teacher. The NDEA provides that if a student goes into teaching in a public elementary or secondary school, up to 50 per cent of the principal (plus interest) of the loan may be cancelled.

Information and applications for NDEA loans, other financial aid, and employment may be obtained from the Office of Student Financial Aid.

**Orientation.** — The Orientation Program provides University personnel with an understanding of the student's background, individuality, and needs. It assists the student in obtaining information about the University and its programs, in learning more about himself, and in selecting professional goals that are compatible with his abilities. All freshmen, transfer students and students pursuing the dual objective program participate in an orientation program for one quarter.

**Counseling.** — Each Education student is assigned to a faculty adviser who assists the student whenever possible. Other sources of assistance include personnel in the Office of the Dean, classroom teachers, personnel in the Student Counseling Service, the offices of the Dean of Women, the Dean of Student Affairs, the Registrar, dormitory head residents and counselors, and ministers of local churches.

**The Selective Admission and Retention Program in Teacher Education.** — The Teacher Education Program is made up of three basic components: the pre-professional program; professional education, including the professional internship; and major and minor teaching fields.

The student will normally complete during his first two years the pre-professional program. Upon completion of 90 quarter hours of appropriate general education courses, the student should submit a written application to the Committee on Selective Admission and Retention to Teacher Education. Criteria for admission are: (1) evidence of adequate scholastic ability, (2) completion of general education requirements, (3) an over-all grade point average of 1.0 (C), (4) evidence of proficiency in English, (5) completion of the Pre-Teaching Field Experience Program, and (6) potential for teaching, evidence of emotional stability and absence of undesirable personal characteristics.

These criteria also apply to transfer students.

While retention in the Teacher Education Program is based on the continuous evaluation of the student, a formal evaluation takes place

as a pre-requisite for admission to the professional internship. At least one quarter prior to the internship the student must submit to the Selective Admission and Retention Committee a formal application for internship approved by his adviser. Requirements for admission to the professional internship are: (1) admission to the Teacher Education Program at least three quarters prior to the professional internship, (2) completion of appropriate courses in area of specialization, (3) a grade point average of 1.25 in all courses completed in professional education and in the teaching major and minor, and (4) evidence of emotional stability and absence of undesirable personal characteristics.

In order to be eligible for graduation with teacher certification, a student will be expected to complete the requirements identified above and achieve a grade point average of 1.5 in his courses in education and in his teaching major and minor.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification. Programs of study are available for earning the Class B and A Certificates and the master's degree. Often, work experiences in the teaching profession and other professional fields permit alternative plans for fulfilling the requirements in a particular program of study. Academic background and work experience are evaluated for purpose of developing the most effective program possible for each student.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Student Personnel Office in Haley Center.

**Placement and Follow-Up.** — The Teacher Placement Service provides, free of charge, assistance to prospective teachers in locating desirable positions and assistance to employers in identifying candidates. Persons interested in placement should contact the Student Personnel Office, Haley Center. Follow-up studies of successes, failures, and problems of graduates are made. Further information may be obtained from the Coordinator of Student Personnel Services in Haley Center.

## Field Services

*Coordinator R. S. Clark*

Field Services constitute the phase of the work of the School of Education which is designed to make the programs and services of the School available to individuals and groups off campus. Field Services enable the School to combine its three major functions: instruction, research, and extension; and make them available to off-campus groups for continuous improvement of public education in the State and region. Major categories of services are available. These follow:

**Off-Campus Instruction.** — This instruction is available through the Field Laboratory Program, enabling teachers in service to complete a total of 16 quarter hours of residence credit toward a graduate degree. The program uses the local school setting as a laboratory in which

graduate courses are provided as a framework for solving instructional problems related to various areas of study. The program may be used as a supplement to existing in-service programs or as a basis for developing such programs.

Short courses may also be offered on a non-credit basis for groups interested in specific areas of education and psychology. The courses may consist of a series of lectures or workshops and are available to groups of professional and non-professional personnel interested in short courses in some specific aspect of their work.

**Educational Television.** — Resources and materials of the School of Education are presented to Alabama citizens through the facilities of the Alabama Education Television Network. Telecasts direct and enrich teaching programs for elementary and secondary school students, and assist teachers in their professional career development programs.

Further information regarding Educational Television at Auburn University is contained elsewhere in this Bulletin. A schedule of courses and specific course study guides may be obtained by writing the Director, Educational Television, Auburn University.

**Lecture and Consultative Service.** — The staff of the School of Education is composed of persons who are skilled in general and specific areas of education. The Office of Field Services coordinates the services of these faculty members for lecture and consultative services. These services may be used with in-service education, school and community projects, teacher workshops and institutes, and community clubs and organizations.

**School Surveys.** — School systems desiring comprehensive school surveys or surveys in specific areas of education such as school plant utilization and construction, school finance, administrative organization, and curriculum and teaching programs, may secure services of this type from the School of Education. Surveys may be conducted as separate projects or in conjunction with the Field Laboratory Program described above.

**Research Services.** — School systems may wish to conduct research in such areas as the instructional program, administrative and supervisory patterns and organizations, school and community projects, the development and evaluation of testing programs, and the use of instructional materials and facilities. The assistance of the staff of the School of Education is available for these activities, either as separate endeavors or in conjunction with the instructional and survey services described above.

**Correspondence Study.** — Correspondence study provides undergraduate instruction for persons unable to attend college on a regular basis. Courses parallel to those given on campus are available in English, education, economics, health, physical education and recreation, history, mathematics, psychology, and sociology. Other courses may be added as the demand warrants. All the courses carry college credit. For information concerning the Correspondence Study Program of Auburn University, see page 45 of this Catalog.

## Learning Resources Center

*Coordinator Dawson*

*Associate Professor Miller*

*Administrative Assistant Brinkley*

*Assistant Professor Knight*

*Instructors Capps, Dean, Hill, Mobbs, Pearce, D. Riggsby,*

*Sanders, and Todd*

*Social Studies Specialist Smith*

*Art Music Specialist Larka*

The Learning Resources Center of the School of Education contains an extensive collection of materials for teaching and learning. These resources complement the materials in the University Library. Varied in nature, they range from selected printed publications to graphic productions. Included are such materials of instruction as transparencies for projection, record players, tape recorders, overhead projection equipment and supplies, television receiving sets, and printed references.

The Learning Resources Center is a service center created primarily to improve instruction through effective use of appropriate materials. Personnel assists faculty and students in producing, selecting, and using these learning resources.

## In-Service Agricultural Education and Supervision

*State Supervisor Faulkner*

*Assistant Supervisors Dilworth, Green, Holley, Halcomb, Lewis, Sellers, and White*

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 345 departments of vocational agriculture in accredited high schools of the State and to more than 25 teachers of veterans.

## Vocational Rehabilitation Service

*Assistant Area Supervisor Jenkins*

*District Supervisor Roberts*

*Counselor Lambert*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.

# Undergraduate Curricula For The Preparation Of Teachers

The following statements set forth requirements and guides for the development of programs for students pursuing a teacher education curriculum. Requirements for the pre-professional program, the program of professional education, and the fields of teaching specialization are stated. Listed also are scholastic requirements, total credit requirements, recommended courses, and provisions for electives in the different preparation programs.

## I. Scholastic Requirements

Students enrolled in the School of Education or those enrolled in other Schools who are pursuing the Dual Objectives Program must meet the following scholastic requirements: a grade point average of 1.0 (on a 3 point scale) for admission to Teacher Education and a grade point average of 1.25 in all courses completed in professional education and in the teaching major and minor for admission to the professional internship. A grade point average of 1.5 in courses in education and the teaching major and minor is expected for graduation with certification.

## II. Pre-Professional Requirements

The pre-professional program as outlined here partially fulfills the liberal arts requirement for students preparing to enter a teacher preparation program leading to professional certification as a teacher in elementary and/or secondary schools. A major portion of the pre-professional requirements will be completed prior to admission to the teacher education program.

### English

EH 101-102-103 English Composition (3-3-3)	9
SP 202 Applied Oral Communication (3)	3
Literature (American, English or World)	9

### Social Science

HY 101-102-103 World History (3-3-3)	9
SY 201 Introduction to Sociology (5)	5
Approved Social Science electives selected from Economics, Geography, History, Political Science and Sociology	10

### Science

#### Biological

BI 101 Prin. of Biology (5)	5
BI 102 General Plant Biology (5)	
BI 103 General Animal Biology (5)	Select 1 5
BI 104 Biology in Human Affairs (5)	

#### Physical

*CH 101-102-104 General Chemistry (3-3-5) or Ch 103-104	
PS 204 Funds. of Physics (5)	
GL 101-102 Intro. Geology (5)	
AA 304 Meteorology (5)	Select 2 10
AY 310 Earth Science (5)	
SED 473 Gen. Science for Tchrs. (5)	
PHS 100-101 Physical Science (5-5) (For Elementary Majors Only)	

\*Required of Home Economics Education majors.



**Mathematics**

Approved Math Course (5) \_\_\_\_\_ 5

**Physical Education**

PE 101-102-103 (1-1-1) \_\_\_\_\_ 3

**Military**

\_\_\_\_\_ 6

**Orientation**

Freshman Orientation or Transfer Orientation (1) \_\_\_\_\_ 1

Introduction to Laboratory Experiences (1) \_\_\_\_\_ 1

**Foundations of Education**

FED 213 Human Development (5) \_\_\_\_\_ 5

FED 214 Educational Psychology (5) \_\_\_\_\_ 5

### III. Professional Requirements

This phase of the Teacher Education Program develops competence in the content and skills of professional teacher education. It adds depth of understanding and gives social meanings to the knowledge acquired. Required professional studies are concerned with the growth and development of the individual, the nature of society, and the functions of education in society. Through the study of professional literature, observations, and laboratory experiences, the student acquires knowledge regarding the history and philosophy of education, the administration and organization of schools, curriculum development, teaching and learning processes, learning resources, and the evaluation of teaching effectiveness.

#### *A. Foundations of Education*

The philosophical, social and psychological Foundations of Education provide background resources essential to effective participation in the teaching profession. The field emphasizes the concepts, principles, and theories essential for understanding and improving educational practices in light of historical developments and current social needs. Formal classwork includes an analysis of historical, philosophical, social, and psychological considerations upon which the educational enterprise is based.

The Foundations of Education aims at providing the resources and methods of formulating, evaluating, and revising educational policies, curriculum designs, schemes of school organization and support, and strategies for teaching and learning. All students in the teacher preparation program will complete FED 213, Human Growth and Development, five hours; FED 214, Psychological Foundations of Education, five hours; FED 320, Social Foundations of Education, 5 hours; and FED 480, Philosophical Foundations of Education, 5 hours. Evaluation of the aims and achievements of the educational enterprise as a whole is a concern of each of these Foundational studies. Also, required laboratory experiences, including the Pre-Teaching Field Experience and the Professional Internship, are evaluated in one or more of these Foundations courses.

#### *B. Teaching and Program*

This phase of the teacher preparation program is designed to assist the student in acquiring the knowledge, understanding, and skills

deemed essential for success in the different specializations. Curriculum development, methodology, teaching and learning resources, and evaluation of teaching effectiveness are emphasized in the various areas of specialization. Each student in the teacher preparation program will complete the courses listed under the school program in which he is preparing to teach.

### 1. Elementary Education

EED 300A Elementary Curriculum I	10
EED 400A Elementary Curriculum II	10
EED 450 Analysis of Elementary Instructional Strategies	5

### 2. Secondary Education

*SED 405 Teaching in Secondary School, or IED 414 Teaching in Elementary and Secondary Schools (Major Fields)	5
*SED 410 Program in Secondary School, or IED 423 Program in Elementary and Secondary Schools (Major Field)	5
SED 405 Teaching in Secondary School, or SED 410 Program in Secondary School (Minor Field) or IED, HPR, or VED 414 Teaching in Elementary and Secondary Schools, or IED, HPR, or VED 423 Program in Elementary and Secondary Schools (Minor Field)	5

\*Teaching and Program courses SED 407 and SED 412, are required in major for students in home economics education.

### 3. Vocational, Technical and Practical Arts Education

VED 410 Occupational Information	5
VED 414 Program in Area of Specialization	5
VED 415 Teaching in Area of Specialization	5
VED 456 Learning Resources in Area of Specialization	5
VED 423 Program in Basic Vocational Education (Minor Field)	5

### 4. Health, Physical Education and Recreation

HPR 414 Teaching in Elementary and Secondary School, and HPR 423 Program in Elementary and Secondary Schools (Major Field)	6
SED 405 Teaching in Secondary Schools, or SED 410 Program in Secondary School (Minor Field)	5
or IED or VED 414 Teaching in Elementary and Secondary Schools, and IED or VED 423 Program in Elementary and Secondary Schools (Minor Field)	5

## C. Laboratory Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Pre-teaching Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Co-operative Education Program**, and (4) the **Professional Internship**.

The **Pre-teaching Field Experience Program** provides an initial baseline laboratory experience for all students in the teacher preparation program. It is initiated in the course, *Introduction to Laboratory Experiences* (EED, SED, VED 104 and HPR 106), with specific follow-up responsibilities assigned to the Foundations Department (FED 213, FED 214, and FED 320). Students are required to participate in the program a minimum of ten full days at the beginning of the public school term in the fall quarter of the year. This experience, a pre-requisite for admission to the Professional Teacher Education Program, involves the student in planning and evaluating learning experiences, counseling, participation in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

**The Extended Laboratory Experiences Program** provides meaningful laboratory experiences for students concurrently with their enrollment in professional education courses (EED 300A and FED 214; EED 400A and FED 320; SED 405 and 410; HPR 414 and 423; IED 414 and 423; VED 414 and 423). These courses are scheduled to provide the student an opportunity to gain work experiences in the Auburn, Opelika, or Lee County Schools.

**The Co-operative Education Program** provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 46).

**The Professional Internship**, the culminating professional laboratory experience for students, is a full time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills and knowledge the student has acquired to classroom situations.

The student enrolls for 15 credit hours and devotes a full quarter to the internship. The program is divided into three phases: orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program three quarters prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students with a major or minor in art; theatre; health, physical education and recreation; industrial arts; music; speech and/or special education, including speech correction and mental retardation, required experience in both elementary and secondary schools. Students in either secondary or elementary education who complete a minor in school library science are required to devote a part of their Internship to appropriate experiences in the school library.

Students who have had teaching experience or other related experiences may be permitted to satisfy the Internship through a special program which is offered for ten quarter hours credit during the Summer Quarter in lieu of the Professional Internship. Students will be considered on an individual basis for the special program.

When the Professional Internship is completed in more than one curriculum area, students may register for a total of 15 quarter hours in combinations of five and ten quarter hours. Professional Internship courses in the various departments are listed as follows:

- EED 425 Professional Internship in Elementary Schools
- IED 425 Professional Internship in Elementary and Secondary Schools
- HPR 425 Professional Internship in Health and Physical Education in Elementary and Secondary Schools
- SED 425 Professional Internship in Secondary Schools
- VED 425 Professional Internship in Vocational, Technical, and Practical Arts Education

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

## IV. Requirements for Major and Minor Fields of Specialization

Study in a major and/or minor field of specialization helps students develop the academic competencies needed for entering the teaching profession with qualifications for teaching in one or more areas of the school program.

A student preparing to teach only at the secondary school level is required to complete a major and a minor field of specialization.

A student enrolled in secondary education may prepare to teach in selected fields on a twelve-grade basis. These fields of specialization are art; theatre; health, physical education and recreation; industrial arts; music; speech, speech correction, and school library science.

Students interested in qualifying to teach in one area of the secondary school program, should study with care the respective fields for specialization with a view of selecting the most appropriate teaching field or fields.

Requirements listed below represent minimum hours for a major and a minor in the respective fields of specialization. The number of hours listed for each field of specialization is exclusive of courses completed in pre-professional and professional education. The requirements also exclude the use of any course as partial fulfillment for both the major and the minor field of study.

SUBJECT	MINOR	MAJOR
Adult Education	24	48
Agricultural Education		75
Art	35-40	45-60
Basic Vocational Education		
Basic Agriculture	28*	43
Basic Building Construction	28*	43
Basic Distributive Education	26*	44
Basic Metal Technology	29*	43
Basic Power Mechanics	29*	44
Business Education		
General Business	33	64
Office Administration	35	66
Composite Major-Minor-Business Management/Economics Management Services/Economics		80
Distributive Education	27	57
English	20	40
Health, Physical Education and Recreation	40	55
Industrial Arts Education	27	50
Mathematics	35	55
Modern Languages	30	40
Music	36	96
Composite Major-Minor-Instrumental and Choral Choral and Elementary School Music		96
School Library Science	28-30	
Science		
General Science		45
Biological Science	30	45
Physics	30	40
Chemistry	30	45
Social Science		
General Social Science		40
Economics	30	40
Geography	30	40
Sociology	30	40
History	30	40

\*For Basic Vocational Education Majors only.

Political Science	30	40
Psychology	27	
Rehabilitation Services Education		57
Speech	32	40-50
Speech Correction	33	41-51
Theatre	32	57
Trade and Industrial Education		60
Vocational Home Economics		68
Composite Major-Minor		86-88

Students pursuing a preparation program for teaching in the secondary school only or for teaching in specific fields in both elementary and secondary school programs will complete the subject-matter requirements as listed under the field or fields in which the student is preparing to teach.

### ADULT EDUCATION

#### Minor: 24 Hours

VED 413 Nature of Adult Education	5
VED (f) 414 Program in Adult Education	3
VED 466 Teaching Out-Of-School Groups	3
VED 491 Problems in Teaching Dis-	
advantaged Adults	3
Approved Electives from 300-400	10

#### Major: 48 Hours

Minor Requirements	24
VED 410 Occupational Information	3
VED 415 (f) Teaching in Adult Education	3
VED 425 (f) Internship in Adult Education	15
VED 456 (f) Learning Resources in Adult	
Education	3

### AGRICULTURAL EDUCATION

#### Major: 75 Hours

AS 301 Agricultural Marketing	5
AS 401 Farm Management	5
VED 404 Practicum in General Metals	5
VED 406 Practicum in Building Construction	5
AY 307 General Soils	5
AH 200 Introductory to Animal Husbandry	5
HF 221 Landscaping Gardening	5
ZY 402 Economic Entomology	5
Approved Agricultural Electives	35

### ART

#### Minor: 40 Hours

AT 105 Drawing I	5
AT 106 Drawing II	5
AT 181 Design Fundamentals I	5
AT 182 Design Fundamentals II	5
AT 222 Painting I	5
AT 338 Art History I	5
AT 342 Elementary School Art	5
AT Approved Elective	5

#### Major: 60 Hours

Minor Requirements	35
AT 322 Painting III	5
AT Approved Elective	5
AT Approved Electives	15

### BASIC VOCATIONAL EDUCATION

Students pursuing a course of study in basic vocational education must select both a major and minor within the Department of Vocational, Technical and Practical Arts Education.

#### A. Basic Agricultural Education

##### Minor: 28 Hours

HF 221 Landscape Gardening	5
HF 224 Plant Propagation	5
AH 204 Animal Nutrition	5
AS 401 Farm Management	5
AS 410 Agriculture Business Management	3
AY 307 General Soils	5

#### Major: 43 Hours

Minor Requirements	28
AH 305 Livestock Production	5
AY 201 Grain Crops	5
AY 401 Forage Crops	5

#### B. Basic Building Construction

##### Minor: 28 Hours

BT 104 Intr. to Buildings	5
BT 105 Drawing and Projections	5
BT 106 Materials and Construction	5
VED 404 Practicum in General Metals	5
VED 405 The School Shop	3
VED 406 Practicum in Building Construction	
and Maintenance	5

#### Major: 43 Hours

Minor Requirements	28
BT 220 Mechanics of Structure	5
BT 421 Construction Problems I	5
VED 407 Practicum in Electricity	5

#### C. Basic Distributive Business

##### Minor: 26 Hours

MT 331 Principles of Marketing	5
MT 333 Salesmanship	3
MT 433 Retail Store Management	5
HE 306 Personal Appearance and	
Social Interaction	3
VED 462 Directed Work Experience	5
Approved Elective	5

#### Major: 44 Hours

Minor Requirements	26
ACF 211 Intr. to Accounting	5
MN 341 Business Law	5
MT 432 Advertising	3
MT 438 Retail Merchandising	5

#### D. Basic Metal Technology

##### Minor: 29 Hours

EG 102 Engineering Drawing I	2
EG 105 Engineering Drawing II	2
IL 102 Welding Science and Application	1
IL 103 Machine Tool Laboratory	1
IL 104 Sheet Metal Design and Fabrication	1
IL 105 Foundry Technology	1
IL 302 Manufacturing Processes-Machining	3
IL 308 Gages and Measurements	5
IL 406 Problems in Machining	5
VED 404 Practicum in General Metals	5
VED 405 The School Shop	3

#### Major: 43 Hours

Minor Requirements	29
EG 204 Kinematics of Machines	3
IL 301 Manufacturing Processes-Casting	3
IL 303 Manufacturing Processes-Shaping,	
Forming, and Fabricating	3
IL 405 Problems in Welding Engineering	5

#### E. Basic Power Mechanics

##### Minor: 29 Hours

EG 102 Engineering Drawing I	2
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EG 105 Engineering Drawing II	2
EG 204 Kinematics of Machines	3
IL 103 Machine Tool Laboratory	1
IL 308 Gages and Measurements	3
VED 400 Introduction to Power Mechanics	5
VED 401 Practicum in Small Gasoline Engines	5
VED 402 Automotive Construction and Repair	5
VED 405 The School Shop	3

**Major: 44 Hours**

Minor Requirements	29
IL 406 Problems in Machining	5
VED 404 Practicum in General Metals	5
Approved Elective	5

**\*BUSINESS EDUCATION****A. General Business****Minor: 33 Hours**

ACF 211-212 Intr. Accounting	10
EC 200 Economics I	5
MN 310 Business Management	5
MN 341 Business Law	5
MN 201 Typewriting II or equivalent	3
MN 200 Office Machines	5

\*Non-business education majors may take minor A or B. Business education majors will complete program requirements in A or B.

**Major: 64 Hours**

Minor Requirements	33
ACF 311-312 Intermediate Accounting	10
MT 331 Principles of Marketing	5
MN 405 Administrative Management	5
EH 345 Business and Professional Writing	5
IE 314 Electronic Data Processing Machines	3
MN 305 Records Management	3

**B. Office Administration****Minor: 35 Hours**

MN 200-201-202 Secretarial Science or MN 201-202-203 Typewriting	9
EC 200 Economics I	5
ACF 211-212 Introductory Accounting	10
MN 400 Office Machines	5
Approved Electives	6

**Major: 66 Hours**

Minor Requirements	35
MN 310 Business Management	5
MN 341 Business Law	5
IE 314 Electronic Data Processing Machines	3
MN 305 Records Management	3
MN 203 Typewriting and/or	
MN 403 Secretarial Procedures I and	
MN 404 Secretarial Procedures II	10
Approved Elective	5

**C. Composite Major-Minor: 80 Hours**

A. Business Management/Economics	
MN 310 Bus. Org. & Management*	5
EC 360 Money and Banking	5
EC 350 Labor Problems	5
MN 455 Government & Business	5
ACF 211, 212, 311, 312 Accounting	20
MN 200, 201, 202 Typewriting I, II, III	9
MN 400 Office Machines	5
MN 305 Records Management	3
IE 301 Elec. Data Pro. & Computer Prog.	5
EH 345 Bus. & Prof. Writing	5
MN 341, 342 Business Law	10
MN 447 Job Evaluation or MN 340 Personal Finance	3
B. Management Services/Economics	
MN 310 Bus. Org. & Management*	5
EC 360 Money and Banking	5
MN 340 Personal Finance	3
MN 455 Government & Business	5
ACF 211 & 212 Accounting	10

\*Prerequisite of EC 200 to be taken in social science general education area.

MN 200, 201, 202 Typewriting I, II, III	9
MN 210, 211, 212, 300 Shorthand I, II, III	20
Transcription I	5
MN 400 Office Machines	5
MN 305 Records Management	5
IE 301 Elec. Data Pro. & Computer Prog.	5
MN 341 Business Law	5
MN 403 Secretarial Procedures I	5

**DISTRIBUTIVE EDUCATION****Minor: 27 Hours**

EC 202 Economics II	5
MT 331 Principles of Marketing	5
MT 333 Salesmanship	5
EC 244 Graphic Method in Business	3
MN 340 Personal Finance	5
EC 350 Labor Problems	5
MT 432 Advertising	3

**Major: 57 Hours**

MT 433 Retail Store Management	5
MT 434 Purchasing	5
MT 435 Marketing Problems	5
MT 438 Retail Merchandising	5
MN 442 Personnel Management	5
VED 458 Coord. and Supervision in VED	5
VED 462 Directed Work Experience	5

**ENGLISH****Minor: 20 Hours**

EH 390 Advanced Composition	5
EH 401 Advanced Grammar or	
EH 441 Introduction to the Study of Language	5
Approved Electives 300-400 English Courses	10

**Major: 40 Hours**

Minor Requirements	20
EH 357 or 358 Survey of American Literature	5
EH 451 or 452 Shakespeare	5
Approved Electives 300-400 English Courses	10

**HEALTH, PHYSICAL EDUCATION, AND RECREATION****Minor: 40 Hours**

Theory & Techniques (Choice of 3 courses) HPR 106, 133, 167, 190, 191, 221, 278	6
HPR 201 Introduction to Physical Education	5
HPR 212 Elementary School Activities	5
*HPR 214 Kinesiology	5
HPR 316 Tests and Measurements	5
HPR 317 School Health & Health Education	5
HPR 318 Principles of Recreation	5
HPR 202, 206, 303, 304 (men)	3
HPR 311, 312, 313, 314 (women)	3
VM 220 Anatomy and Physiology	5

\*PR. - VM 220, Physics 204.

**Major: 55 Hours**

Minor Requirement	40
One minor area composed of courses selected from A, B, or C	10
HPR 401 Organization & Administration	5

**A. Health Education**

NF 372 Funds. of Nutrition	5
HPR 409 Advanced Health Science	5
HPR 429 Problems of Health Education and Observation of School Children	5
PY 300 Public Health	5
VM 311 General Bacteriology	5

**B. Physical Education**

Theory & Techniques (Choice of 2 courses) HPR 106, 133, 167, 190, 191, 221, 278	4
HPR 404 Athletic Injuries	5
**HPR 405 Physiology of Muscular Activity	5
HPR 416 Adapted Physical Education	5

\*\*Required in Option B.



HPR 202, 206, 303, 304 (men)	
HPR 311, 312, 313, 314 (women)	6
<b>C. Recreation</b>	
HPR 301 Recreational Leadership	5
HPR 319 Outdoor Recreation	5
CA 345 Creative Crafts	3
SY 405 Urban Sociology	5

**HOME ECONOMICS****Major: 68 Hours**

NF 102 Basic Foods and Nutrition	5
CA 110 Contemporary Home Economics	1
CA 113 Housing For Man	3
CA 115 Clothing and Man	3
CA 105 Fundamentals of Clothing	5
CA 116 Art for Everyday Living	3
NF 119 Nutrition and Man	3
NF 202 Meal Management	5
CA 205 Clothing for the Family	3
FCD 207 Principles of Child Development	3
HF 225 Flower Arranging	3
FCD 257 The Family and Human Development	3
CA 233 Home Equipment	
CA 303 The House	Select I 5
CA 315 Home Furnishings	
CA 343 Interior Home Problems	
CA 305 Tailoring	5
CA 431 Man-Environmental Relations	2
FCD 323 Management for Modern Living	3
FCD 443 Home Management Residence	5
FCD 457 Family Relations	5
Approved electives	5

**Composite Major - Minor**

Major Requirements	68
Completion of A, B, C or D	18-20

**A. Clothing and Textiles**

CA 315 Textiles	5
CA 395 Clothing Design	5
CA 405 Creative Costume Design	5
Approved Electives from 300-400 courses	3-5

**B. Family Life and Child Development**

FCD 307 Principles of Child Development	5
FCD 317 Adolescent and the Family	5
FCD 417 Guidance of Children	5
FCD 467 Parent Education	5

**C. Foods and Nutrition**

NF 302 Cultural Aspects of Food Service	3
NF 372 Fundamentals of Nutrition	3
NF 392 Family Nutrition	3
NF 442 Catering	3
Approved electives from 300-400 courses	6-8

**D. Home Management, Housing and Equipment**

CA 233 Home Equipment or CA 313 Home Furnishings	5
CA 303 The House or CA 343 Interior Home Problems	5
FCD 453 The Consumer and the Market	5
FCD 463 Family Economics	5

**INDUSTRIAL ARTS EDUCATION****Minor: 27 Hours**

IL 101 Woodworking	1
IL 102 Welding Science	1
IL 103 Machine Tool Laboratory	1
IL 104 Sheet Metal Design	1
IL 105 Foundry Technology	1
IL 402 Advanced Wood	5
IL 307 General Metals	5
VED 407 Practicum in General Metals	5
CA 345 Creative Crafts	2
VED 246 Instructional Drawing	3
EG 102 Engineering Drawing	2

**Major: 50 Hours**

VED 406 Practicum in Building Construction and Maintenance	5
VED 409 Teaching Electronics in Industrial Arts	5
Elective in Metal Area	5
Elective in Power Area	5
Elective in Drawing Area	3

**MATHEMATICS****Minor: 35 Hours**

MH 160 Algebra and Trigonometry	5
MH 161 Analytic Geom. & Calculus I	5
MH 162 Analytic Geom. & Calculus II	5
MH 163 Analytic Geom. & Calculus III	5
MH 220 Intro. To Analysis I	5
MH 331 Intro. to Modern Alg. I	5
MH 441 Geometry, A Modern View I	5

**Major: 55 Hours**

Minor requirements	35
MH 221 Intro. to Analysis II	5
MH 332 Intro. to Modern Alg.	5
MH 367 Mathematical Statistics	5
Approved Elective	5

**MODERN LANGUAGES****A. Spanish****Minor: 30 Hours**

FL 131 Elementary Spanish	5
FL 132 Elementary Spanish	5
FL 231 Intermediate Spanish	5
FL 232 Intermediate Spanish	5
FL 331 Advanced Spanish	5
FL 332 Advanced Spanish	5

**Major: 40 Hours**

Minor Requirements	30
FL 431 Contemp. Spanish Lit. I	5
FL 432 Contemp. Spanish Lit. II	5

**B. German****Minor: 30 Hours**

FL 151 Elementary German	5
FL 152 Elementary German	5
FL 251 Intermediate German	5
FL 252 Intermediate German	5
FL 351 Advanced German	5
FL 352 Advanced German	5

**Major: 40 Hours**

Minor Requirements	30
FL 451 History of German Literature	5
FL 452 History of German Language	5

**C. French****Minor: 30 Hours**

FL 121 Elementary French	5
FL 122 Elementary French	5
FL 221 Intermediate French	5
FL 222 Intermediate French	5
FL 321 Advanced French	5
FL 322 Advanced French	5

**Major: 40 Hours**

Minor Requirements	30
FL 421 History of French Literature	5
FL 422 History of French Language	5

**MUSIC****Minor: 36 Hours**

MU 131, 132, 133 Material and Organization of Music Applied (one area; if piano, organ will be secondary area)	15
MU 352, 353 Music History II & III	6
MU 361 Conducting I	3
SED 494 Organization of Instrumental Music - Piano (Private applied or class, to be assigned by staff committee)	3

**Major: 66 Hours**

Minor Requirements	36
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Band, Orchestra, Choir or Mixed Chorus	11
MU 231, 232, 233 Music Theory Applied, Major Area	5
MU 351 Music History I	3
MU 362, 363 Conducting II & III	2
<b>Composite Major-Minor: 96 Hours</b>	
Major Requirements	66
Completion of A or B	30

**A. Instrumental and Choral**

MU 431, 432 Musical Analysis Electives (Woodwind, brass, string, vocal ensemble)	4
MU 115, 114, 115 Brass Instruments Class	3
MU 116, 117, 118 Woodwind Instruments Class	3
MU 477 Music Arranging	3
MU 409 Marching Band Techniques	3
MU 454 Instrumental Literature	3
SED 495 Organization of Choral Music	3
MU 110 String Instruments Class	1
MU 119 Percussion Instruments Class	1

**B. Choral and Elementary School Music**

MU 431, 432 Music Analysis Music Electives	6
EED 497 Organization of Elementary Music	3
MU 334 Counterpoint I	3
MU 434 Composition Applied Piano	3
MU 452 Vocal Literature	3
MU 455 Choral Literature	3

**REHABILITATION SERVICES EDUCATION****Major: 57 Hours**

VED 330 Careers in Rehabilitation	5
PG 212 Introduction to Psychology II	4
SY 305 Cultural and Personality	3
SY 406 Introduction to Social Welfare	5
VM 210 Human Physiology	5
SP 273 Group Problem Solving Through Discussion	5
AED 421 Guidance in the Public Schools Approved Electives in Area of Specialization	25

**SCHOOL LIBRARY SCIENCE****Minor: 28-30 Hours**

IED 472 Books and Related Materials for Children	4
IED 482 Organization and Administration of School Libraries	5
IED 484 Class. & Cataloging of School Library Materials	5
IED 486 Books and Related Materials for Young People	5
IED 487 Practicum in School Library Services	4-6
VED 485 Audio-Visual Materials	5

**SCIENCE****A. General Science****Major: 45 Hours**

CH 103-4 General Chemistry	10
BI 103 Biology	5
PS 205-6 General Physics	10
SED 473 General Science for Teachers Approved Electives (5 hrs. must be from biological science)	15

**B. Biological Science****Minor: 30 Hours**

BI 103 Biology	5
ZY 214 Vertebrate Physiology & Anatomy	5
Approved Electives	20

**Major: 45 Hours**

Minor Requirements	30
Approved Electives	15

**\*C. Physics****Minor: 30 Hours**

PS 201 Mechanics	5
PS 202 Sound, Heat, Electricity	5
PS 203 Electromagnetism and Light	5
PS 301 Intermediate Electricity and Magnetism	5
PS 305 Modern Physics	5
PS 302 Electronics	5

**Major: 40 Hours**

Minor Requirements	25
Approved Electives to be selected from:	
PS 415 Intr. to Quantum Mech.	
PS 421 Modern Electronics	
PS 303 Optics	
PS 435 Intr. to Solid State Physics	15

\*Physics majors will complete minor in mathematics (including MH 361).

**D. Chemistry****Minor: 30 Hours**

CH 103 General Chemistry	3
CH 104 General Chemistry	5
CH 105 General Chemistry	5
CH 207 Organic Chemistry	5
CH 208 Organic Chemistry	5
Approved Elective	5

**Major: 45 Hours**

Minor requirements	30
Approved Electives	15
Prerequisites for CH 105. Credit in these courses applied to general education requirement in physical science.	

**SOCIAL SCIENCE**

All students majoring in political science, sociology, economics, or geography, and not minoring in history; and all students minoring in political science, sociology, economics, geography or psychology and not majoring in history; must include in their social science general education requirements the following:

U. S. History 5 hours

**Major: 45 Hours**

HY 107 United States History	5
SY 201 Introduction to Sociology	5
EC 200 Economics I	5
PO 209 Introduction to American Government	5
GY 102 or 103 Prins. of Econ. Geography	5
Approved elective from 300-400 course in U. S. History	5
Approved electives from 300-400 courses in Sociology, Economics, Political Science and Geography	15

**1. Economics****Minor: 30 Hours**

EC 200 Economics I	5
EC 202 Economics II	5
EC 456 Intermediate Macro Economics	5
EC 452 Comparative Economics Systems	5
Approved 300-400 level economics courses	10

**Major: 40 Hours**

Minor requirements	25
EC 274 (Business and Ec. Statistics I)	5
Approved 300-400 level Ec. courses	10

**2. Geography****Minor: 30 Hours**

GY 102 Principles of Geography	5
GY 103 Economic Geography	5
GY 405 Cultural Geography of the World	5
Approved 300-400 level courses in GY	15

**Major: 40 Hours**

Minor requirements	25
Approved 300-400 level GY Courses	15

**3. Sociology****Minor: 30 Hours**

SY 201	Introduction to Sociology	5
SY 203	Cultural Anthropology	5
	Approved 300-400 level Sociology Courses	20

**Major: 40 Hours**

	Minor requirements	25
SY 202	Social Problems	5
SY 304	Minority Groups	5
SY 308	Juvenile Delinquency	5

**4. History****Minor: 30 Hours**

U. S. HY	(5 hours above freshman level)	10
	Selections from Latin American area	5
	Selections from non-western, non-American area	5
	Approved 300-400 level history courses	10

**Major: 40 Hours**

	Minor requirements	25
	Selected 300-400 level courses in areas of student's choice providing depth study in one area	15

**5. Political Science****Minor: 30 Hours**

PO 209	National Government	5
PO 210	State Government	5
PO 309	Intro. to International Relations or	
PO 312	An Intro. to Comparative Gov.	5
	Approved 300-400 level PO courses	15

**Major: 40 Hours**

	Minor requirements	25
PO 407	Political Science	5
PO 422	Recent and Contemporary Political Theory	5
PO 340	Political Parties and Politics, PO 323 Municipal Gov. in the U.S., or PO 405 Metropolitan Area Gov. Problems	5
PO 445	The Gov. and Politics of the Developing Nations	5

**6. Psychology****Minor: 27 Hours**

PG 211	Introduction to Psychology I	5
PG 215	Quantitative Methods in Psychology	4
PG 330	Social Psychology	4
PG 415	Psychological Testing	5
PG 480	History of Psychology	4
PG	Elective	5

**SPEECH****Speech****Minor: 32 Hours**

SP 201	Intr. to Oral Comm.	5
SP 211	Essentials of Public Speaking	5
SP 200	Survey of the Bases of Speech	5
SP 273	Group Discussion	5
SED 201 (P)	Communication Problems	2
	Minors select 10 hours from the major requirements listed below:	

**Major: 40 or 50 Hours\***

	Minor Requirements	32
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Majors select 8-18\* hours from the following approved electives.

\*Requirement of 50 hours for concentration in one area only—when program of study includes two or more areas of concentration a minimum of 40 hours must be completed in one area.

†Credit for VED 475-480 (inc.) (5-5-5-5-5) by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to journeyman level. If employment experience required for certification is obtained prior to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

SP 220	Interpretative Reading	5
SP 311	Advanced Public Speaking	5
SP 230	Fundamentals of Radio and Television Broadcasting	5
SP 451	Principles of Speech Correction	5
SP 411	Persuasive Speaking	5
	Approved Elective	3

**Speech Correction\*\*****Minor: 33 Hours**

SP 201	Introduction to Oral Comm.	5
SP 211	Essentials of Public Speaking	5
SP 301	Phonetics	3
SP 300	The Speech Mechanism	5
SP 460	Introduction to Problems in Hearing	5
SP 451	Principles of Speech Correction	5
SP 401	Psychology of Communication	5

**Major: 41 or 51 Hours\***

	Minor Requirements	33
	Majors select 8-18** hours from the following approved electives	
IED 476	The Exceptional Child	5
PE 409	Advanced Hygiene or	
FCD 434	Mental Hygiene	5
SP 453	Advanced Speech Correction	5
	Approved Elective	3

\*\*Additional work required: 200 clock hours in an approved Speech and Hearing Clinic.

**THEATRE****Minor: 32 Hours**

TH 104	Intr. Theatre I	3
TH 105	Intr. Theatre II	3
TH 106	Intr. Theatre Projects	3
TH 204	Fund. of Acting I: Voice	5
TH 205	Fund. of Acting II: Movement	5
TH 206	Acting I	5
TH 304	Fund. of Stage Design	5
TH 107	Stage Craft I	1
TH 108	Stage Craft II	1
TH 109	Stage Craft Project	1
TH 201	Theatre Artists in Society I	3
TH 202	Theatre Artists in Society II	3
TH 203	Theories of Acting	3
TH 301	History of Theatre in Western Civilization	3

**Major: 57 Hours**

	Minor Requirements	32
TH 305	Design in the Theatre I	5
TH 306	Design in the Theatre II	5
TH 404	Directing I	5
TH 405	Directing II	5
TH 406	Directing III	5
TH 302	History of Theatre in Western Civilization	3
TH 303	History of Theatre in Western Civilization	3
TH 401	Play Analysis	3
TH 402	World Theatre	3
TH 403	Seminar & Theatre Research	3

**TRADE AND INDUSTRIAL EDUCATION****Major: 60 Hours**

VED 475-480	Trade and Industrial Exp.†	30
EH 345	Business and Professional Writing	5
MN 310	Business Organization and Management	5
EC 350	Labor Problems	5
MT 331	Principles of Marketing	5
VED 458	Coord. and Supervision of VED	3
VED 246	Instructional Drawing	3
	Approved Electives	4

## V. Guides for the Completion of Curricular Requirements for the Respective Preparation Programs in Teacher Education

The following curricular outlines set forth requirements and suggestions for preparing teachers to teach in the elementary school, the respective fields of the secondary school, and elementary-secondary in art; theatre; health, physical education and recreation; industrial arts; music; speech, speech correction, and school library science. Provisions are made for meeting the requirements in the pre-professional program, the program in professional education, academic majors and minors, and electives. Specified also are the total number of hours required for the completion of each curriculum and the number of hours assigned to each quarter. In general, courses listed should be taken in sequence.

The Dean reserves the privilege of making substitutions in course requirements, provided such modifications do not conflict with state requirements or university regulations as to degrees in Education.

### A. Elementary Education (EED)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	HY 103 World History _____ 3
BI 101 Prin. of Biology _____ 5	BI 104 Biology in Human Affairs _____ 5	GY 102 Prin. of Geog. _____ 5
EED 103 Orientation _____ 1	SP 202 App. Oral Comm. _____ 3	GY 103 Economic Geog. _____ 5
PE 101 Physical Education _____ 1	PE 102 Physical Education _____ 1	EED 104 Intr. to Lab. Experiences _____ 1
Elective _____ 3	Elective _____ 3	PE 103 Physical Education _____ 5
		Elective _____ 5
SOPHOMORE YEAR		
MH 281 Elem. Math _____ 5	MH 282 Elem. Math _____ 5	MH 283 Elem. Math _____ 5
EH 253 Sur. Eng. Lit. _____ 3	EH 254 Sur. Eng. Lit. _____ 3	EH 357-358 Sur. of Amer. Lit. _____ 5
SY 201 Intr. Sociology _____ 5	EH 357 Sur. Amer. Lit. _____ 5	PO 209 U.S. Government _____ 5
HPR 212 Elem. School Activities _____ 3	EC 200 Economics I _____ 5	HY 201 History of U.S. _____ 5
Elective _____ 3	MU 371 Intr. to Music _____ 3	Elective _____ 3
JUNIOR YEAR		
AT 342 Elem. Sch. Art _____ 5	SP 450 Prin. of Speech Correction _____ 5	FED 214 Psych. Fnds. of Education _____ 5
Physical Science _____ 5	FED 213 Human Growth and Development _____ 5	FED 300A Elem. Curriculum I, Reading and Other Lang. Arts; Creative Expression _____ 10
Electives _____ 10	Physical Science _____ 5	
	Elective _____ 5	
SENIOR YEAR		
FED 320 Social Fnds. of Education _____ 5	EED 425 Professional Internship _____ 15	FED 480 Phil. Fnds. of Education _____ 5
EED 400A Elem. Curriculum II, Math; Natural and Social Sciences _____ 10		EED 450 Analysis of Instructional Strategies _____ 3
		English Elective _____ 3
		Electives _____ 9

Total — 210 quarter hours

### B. Secondary Education (SED)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 English _____ 3	EH 102 Eng. Comp. _____ 3	EH 103 Eng. Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	HY 103 World History _____ 3
BI 101 Prin. of Biology _____ 5	BI 104 Bio. in Human Affairs _____ 5	Phy. Sci. Elec. _____ 5
SP 202 App. Oral Comm. _____ 3	Math Elective _____ 5	Soc. Sci. Elec. _____ 5
SED 102 Orientation _____ 1	MS Military Science (men) _____ 1	SED 104 Intr. Lab. Exp. _____ 1
MS Military Science (men) _____ 1	PE Physical Education _____ 1	MS Military Science (men) _____ 1
PE Physical Education _____ 1		PE Physical Education _____ 1

**SOPHOMORE YEAR****Second Quarter**

EH 253 Lit. in Eng.	3
SY 201 Intr. to Soc.	5
MS Military Science (men)	1
Phy. Sci. Elec.	5
Major-Minor	3

FED 213 Human Growth & Development	5
Major-Minor	9
MS Military Science (men)	1
Approved Lit. Elec.	3

**JUNIOR YEAR**

FED 320 Soc. Found. of Education	5
Major-Minor (or approved elec.)	15

Teaching a Program in Major or Spec.	3
Major-Minor (or approved elec.)	15

**SENIOR YEAR**

Prog. in Area of Specialization	3
Major-Minor (or approved elec.)	15

425 Professional Internship	15
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**Third Quarter**

FED 214 Psy. Found. of Education	5
Major-Minor	8
MS Military Science (men)	1
Approved Lit. Elec.	3

Teaching a Program in Major or Minor Area of Spec.	3
Major-Minor (or approved elec.)	15

FED 480 Phil. & Historical Foundations of Ed.	5
Major-Minor (or approved elec.)	10

Total - 210 quarter hours

**C. Health, Physical Education, and Recreation (HPR)****FRESHMAN YEAR****Second Quarter**

EH 101 English Comp.	3
HY 101 World History	3
BI 101 Prin. of Biology	3
HPR Theory & Tech.	2
HPR 105 Orientation	1
MS 101 Military Training (men)	1
PE 101 Physical Education	1

EH 102 English Comp.	3
HY 102 World History	3
BI 103 Gen. Anim. Biol.	5
MH 121 or 281 Math	5
MS Military Training (men)	1
PE 102 Physical Education	1

**Third Quarter**

EH 103 English Comp.	3
HY 103 World History	3
HPR 201 Intr. to Physical Education	5
HPR 110 Health Science (women)	3
MS Military Training (men)	1
PE 103 Physical Education	1
HPR 108 Intr. to Lab. Exper.	1
Electives	2

**SOPHOMORE YEAR**

VM 220 Anat. & Physiol.	5
FED 213 Human Develop.	5
HPR 212 Elem. Sch. Act.	3
HPR Theory & Technique	2
MS Military Training (men)	1
EH 253 Lit. in English	3

FED 214 Psych. Found. of Educ.	5
SY 201 Intr. to Sociology	5
HPR Theory & Technique	2
MS Military Training (men)	1
HY 201 or 202 U.S. History	5

**JUNIOR YEAR**

HPR 317 Sch. Health	5
FED 320 Social Found. of Educ.	5
HPR 316 Tests & Measurements	3
HPR 214 Kinesiology	5

HPR 423 Program HPE	3
HPR Option Area A, B, or C	5
Electives	10
Approved Literature	3

HPR 318 Principles of Rec.	5
HPR 414 Teaching HPE	3
HPR Teach. & Coach.	3
Electives	6

**SENIOR YEAR**

HPR 401 Org. & Admin.	3
HPR Option A, B, or C	5
Teach. or Program (minor)	3
Electives	5

HPR 425 Professional Internship HPE	15
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FED 480 Phil. Found. of Educ.	5
SED 473 Gen. Sci. for Teachers or Physical Sci. elective	5
HPR Option A, B, or C	3
Electives	5

Total - 210 quarter hours

**D. Vocational, Technical and Practical Arts (VED)****FRESHMAN YEAR****Second Quarter**

HY 101 World History	3
EH 101 English Comp.	3
BI 101 Prin. of Biology	5
MS Military Training	1
VED 103 Freshman Orient.	1
PE Physical Education	1
Approved Elective	1

HY 102 World History	3
EH 102 English Comp.	3
BI 102 Gen. Plant Biol.	5
or	
BI 103 Gen. Anim. Biol.	5
or	
BI 104 Biol. in Hum. Affairs	5
MS Military Training	1
PE Physical Education	1
SP 202 App. Oral Comm.	3

**Third Quarter**

HY 103 World History	3
EH 103 English Comp.	3
VED 103 Intr. to Lab. Experiences	1
PE Physical Education	1
MS Military Training	1
Approved Physical Science	5
Elect.	5
Approved Math	5

## SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
SY 201	Intr. to Socio. _____ 5	EC 200	Economics I* _____ 5	FED 214	Ed. Psychology _____ 5
	Literature Elective _____ 3	FED 213	Human Develop. _____ 5	VED 346	Voc., Tech., & _____ 5
MS	Military Training _____ 1		Lit. Elective _____ 3		Pract. Arts Ed. _____ 5
Approved	Physical Sci. _____ 5	MS	Military Training _____ 1		Approved Soc. _____ 5
Approved	Elective _____ 5	EH 345	Bus. & Prof. _____ 5	MS	Sci. Elect. _____ 5
			Writ.** _____ 5		Military Training _____ 1
		EH 304	Tech. Writ.*** _____ 3		Literature Elec. _____ 3
		JM 315	Ag. Journal**** _____ 3		

\*AS 202 for Agricultural Educ. majors.

\*\*Rehabilitation Services majors.

\*\*\*Industrial Arts, Distributive Educ., and Trade and Industries majors.

\*\*\*\*Agricultural Education majors.

## 1. Adult Education

First Quarter		Second Quarter		Third Quarter	
VED 413	Nat. of Adult _____ 5	VED 414	Prog. in Adult _____ 5	VED 415	Tch. in Adult _____ 5
Approved	Subj. Matter _____ 9	Approved	Subj. Matter _____ 10	VED 456	Lrng. Resources _____ 5
FED 320	Soc. Found. of _____ 5	VED 410	Occup. Infor. _____ 5	Approved	Subj. Matter _____ 13
	Education _____ 5				Electives** _____ 13
VED 466	Educ. Activities _____ 3	VED 425	Professional _____ 15	FED 480	Phil. Found. of _____ 5
Approved	Subj. Matter _____ 15		Adult Educ. _____ 15	VED 491	Probs. in Tchng. _____ 5
	Electives** _____ 15				Disadvantaged _____ 5
				Approved	Subj. Matter _____ 10
					Electives** _____ 10

## 210 - Quarter Hours

\*A minor in Adult Education may be earned by completing VED 413, VED 414, VED 466, and VED 491 plus approved electives for a total of 24 hours.

\*\*Approved electives in not more than two subject matter fields of concentration.

## 2. Agricultural Education

First Quarter		Second Quarter		Third Quarter	
HF 221	Landscape _____ 5	VED 404	Pract. in Gen. _____ 5	VED 415	Teaching in Agric. _____ 5
AH 200	Intr. to Animal _____ 5	AY 307	General Soils _____ 5	VED 456	Learning Res. _____ 5
	Husbandry _____ 5	VED 414	Program in Agric. _____ 3	VED 406	Pract. in Bldg. _____ 5
Approved	Agri. Elective _____ 5	VED 410	Occup. Infor. _____ 3		Const. & Maint. _____ 5
FED 320	Soc. Found. of _____ 5			Approved	Agronomy Elect. _____ 5
	Educ. _____ 5			Approved	Agric. Elect. _____ 2
VED 466	Teaching Out-of _____ 3	VED 425A	Professional _____ 15	FED 480	Phil. Found. of _____ 5
AS 301	Agric. Marketing _____ 5		Agric. _____ 15	Approved	Agriculture _____ 13
Approved	Animal, Poultry, _____ 5				Electives _____ 13
	or Dairy Science _____ 5				
AS 401	Farm Management _____ 5				

## Total - 210 quarter hours

## APPROVED ELECTIVES

AS 410	Agricultural Business _____ 5	AY 414	Principles & Use of _____ 5	HF 323	Greenhouse Const. _____ 5
AS 411	Economic Develop- _____ 5		Herbicides in Crop _____ 5		& Management _____ 5
	ment Of Rural _____ 5	AS 204	Animal Biochemistry _____ 5	HF 201	Orchard Mgtment. _____ 5
AN 350	Soil and Water _____ 5		Production _____ 5	HF 308	Vegetable Crops _____ 5
AN 351	Technology _____ 5	AS 302	Feeds and Feeding _____ 5	PH 501	General Poultry _____ 5
AN 352	Agricultural _____ 5	AS 303	Livestock Production _____ 5		Husbandry _____ 5
	Machinery Technology _____ 5	AS 200	Fundamentals of _____ 5	VED 246	Instructional _____ 5
AN 352	Tractor and Engine _____ 5		Dairying _____ 5		Drawing _____ 5
AY 201	Grain Crops _____ 5	FY 313	Farm Forestry _____ 5	VED 405	The School Shop _____ 5
AY 401	Forage Crops _____ 5	HF 224	Plant Propagation _____ 5	VED 407	Practicum in _____ 5
					Electricity _____ 5



## 3. Basic Vocational Education

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
Major Electives _____ 10	VED 414 Program in _____ 3	VED 415 Teaching in _____ 3
Minor Electives _____ 5	Basic VED _____ 3	Basic VED _____ 3
FED 320 Soc. Found. of _____ 5	(Major) _____ 5	VED 456 Learning Resources _____ 3
Education _____ 5	Major Elective _____ 5	in VED _____ 3
	Minor Elective _____ 5	Major Elective _____ 7
	VED 410 Occup. Infor. _____ 3	Minor Elective _____ 5
SENIOR YEAR		
VED 423 Program in Basic _____ 3	VED 425 Professional In- _____ 15	FED 480 Phil. Found. of _____ 5
VED (Minor) _____ 3	ternship in Basic _____ 15	Education _____ 5
Major Electives _____ 15	VED _____ 15	Major Elective _____ 5
		Minor Electives _____ 8

## Total - 210 quarter hours

Note: See page 127 for the listing of approved major and minor electives in the basic vocational specialization fields of agriculture, building construction, distributive business, metals technology and power mechanics.

## 4. Distributive Education

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
MT 331 Prin. of _____ 5	VED 414 Prog. in Dist. _____ 5	VED 415 Teaching in Dist. _____ 3
Marketing _____ 5	Education _____ 5	Education _____ 3
MT 333 Salesmanship _____ 3	MT 432 Advertising _____ 3	VED 456 Learning Res. in _____ 3
EC 244 Graphic Methods _____ 3	MT 433 Retail Store _____ 5	Dist. Educ. _____ 3
in Business _____ 3	Mgmtmt. _____ 5	MT 434 Purchasing _____ 5
Electives _____ 3	HE 355 Consumer Textiles _____ 3	EC 350 Labor Problems _____ 5
FED 320 Soc. Found. of _____ 5	VED 410 Occup. Infor. _____ 3	
Education _____ 5	Electives _____ 5	
SENIOR YEAR		
VED 466 Teaching Out-of- _____ 3	VED 425 Professional In- _____ 15	FED 480 Phil. Found. of _____ 5
Sch. Groups _____ 3	ternship in Dist. _____ 15	Education _____ 5
MT 435 Marketing Probs. _____ 5	Educ. _____ 15	MN 442 Personnel Mgtmt. _____ 5
MT 438 Retail Mer- _____ 5		VED 462 Directed Work _____ 5
chandising _____ 5		Experience _____ 5
VED 458 Coord. & Super- _____ 3		Electives _____ 3
vision in VED _____ 3		
Electives _____ 2		

## Total - 210 quarter hours

NOTE: Electives to be taken in Adult Education, Psychology, Sociology or in other subject-matter areas which will aid the student in teaching Distributive Education in the high school, at post-secondary level, and adult programs.

## 5. Industrial Arts

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
Selected Courses in: _____ 5	VED 414 Prog. in Ind. Arts _____ 3	VED 415 Teaching in Ind. _____ 3
Wood Area _____ 5	Selected Courses in: _____ 5	Arts _____ 3
Metals Area _____ 5	Electronics Area _____ 5	VED 456 Learning Res. in _____ 3
Electricity Area _____ 5	Drafting Area _____ 5	Ind. Arts _____ 3
FED 320 Soc. Found. _____ 5	VED 410 Occup. Infor. _____ 3	Selected Courses in: _____ 3
of Educ. _____ 5		Drafting Area _____ 3
		Basic Ind. Lab. _____ 2
		Course _____ 2
		Industrial Crafts _____ 3
		Metals Area _____ 5
SENIOR YEAR		
VED 466 Teaching Out-of- _____ 3	VED 425 Professional In- _____ 15	FED 480 Phil. Found. of _____ 5
School Groups _____ 3	ternship in Ind. _____ 15	Educ. _____ 5
Selected Courses in: _____ 5	Arts _____ 15	Selected Courses in: _____ 5
Power Mechanics _____ 5		Minor (Science, Eng., _____ 9
Area _____ 5		History or Econ.) _____ 9
Wood Area _____ 5		Program Minor _____ 3
Minor (Science, _____ 5		
English, History, _____ 5		
or Economics) _____ 5		

## Total - 210 quarter hours

## 6. Rehabilitation Services Education

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
PG 212 Intr. to Psy. II _____ 4	VED 414 Program in Rehabilitation _____ 3	VED 415 Teaching in Rehabilitation _____ 3
SY 305 Culture and Personality _____ 3	SY 406 Intr. to Soc. Welfare _____ 5	VED 456 Learning Res. in Rehabilitation _____ 3
Selected Electives _____ 3	Selected Electives _____ 8	VM 210 Human Physiology _____ 5
FED 320 Soc. Found. of Educ. _____ 5	VED 410 Occup. Infor. _____ 3	Selected Electives _____ 7
SENIOR YEAR		
VED 466 Teaching Out-of-Sch. Groups _____ 3	VED 425 Professional Internship in Rehabilitation _____ 15	FED 480 Phil. Found. of Education _____ 5
VED 435 Voc. Eval. in Rehabilitation _____ 5		SP 273 Group Problem Solving _____ 5
AED 421 Guidance in Public Schools _____ 5		Selected Electives _____ 10
Selected Electives _____ 5		

## Total — 210 quarter hours

NOTE: Rehabilitation majors required to take minimum of 25 elective hours in a selected area of special interest.

## 7. Trade and Industrial Education

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
VED 475 Trade & Teach. Experience* _____ 5	VED 414 Prog. in Trade & Ind. Educ. _____ 3	VED 415 Teaching in Trade & Ind. Education _____ 3
EH 345 Business & Prof. Writing _____ 5	EC 350 Labor Problems _____ 5	VED 456 Learn. Res. in Trade & Ind. Education _____ 3
MN 310 Business Organ. & Mangmnt. _____ 5	VED 476 Trade & Ind. Exp. _____ 5	VED 477 Trade & Ind. Exp. _____ 5
FED 320 Soc. Found. of Educ. _____ 5	VED 410 Occup. Infor. _____ 3	MT 331 Principles of Marketing _____ 5
SENIOR YEAR		
VED 466 Teaching Out-of-Sch. Groups _____ 3	VED 425 Professional Internship in Trade & Ind. Ed. _____ 15	FED 480 Phil. Found. of Education _____ 5
VED 474 Org. of Inst. in T. & I. _____ 5	VED 479 Trade & Ind. Experience _____ 5	VED 480 Trade & Ind. Experience _____ 5
VED 478 Trade & Ind. Experience _____ 5		VED 246 Inst. Drawing _____ 3
VED 458 Coord. & Supr. in VED _____ 3		Electives _____ 4

## Total — 210 quarter hours

\*Credit for VED 475-480 (inc.) (5-5-5-5-5-5) by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

# School of Engineering

J. GRADY COX, *Dean*  
FRED H. PUMPHREY, *Dean Emeritus*

## *The Profession*

THE ENGINEERING PROFESSION applies a knowledge of the mathematical and natural sciences in developing ways to utilize the materials and forces of nature for the benefit of mankind. The various curricula in engineering prepare the students to work and serve in this profession. It is largely through the efforts of the engineer that it is now possible for our American civilization to consider the elimination of want.

## **Liberal Education**

As a professional man the engineer must have a broad general education so that he may take his place not only in the technical councils of American citizenry, but in social and political councils as well. It is essential, therefore, that he have a truly liberal education and the engineering curricula are designed with this objective in mind.

## *Admission Requirements*

As indicated above, the requirements for a good liberal education necessitate high school preparatory work of high intellectual quality and of considerable breadth. For admission to the curriculum in Pre-Engineering, graduation from an approved secondary school with a minimum of 15 units, or the equivalent as shown by examination, is required. The following program is recommended as *minimum* preparation for a college engineering education: English, four units; mathematics (including algebra, geometry, trigonometry, and analytic geometry); chemistry, one unit; mechanical drawing, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but are not required for admission.

The ability to communicate with his fellow man is absolutely essential to the engineer. The secondary school student needs four years of English in order to gain the ability to read, write, speak, and listen with precision, facility, clarity, and understanding. The achievements of engineering have made possible communication and travel throughout the world which in reality have brought all countries closer together. All educated Americans and particularly engineers should recognize this fact and prepare for it by studying at least one foreign language as early as possible—even in elementary school or junior high school. The study of at least one foreign language (including the classical languages) for a minimum of two years in secondary school is highly recommended but not required for admission.

Mathematics and the sciences are the fundamentals upon which the profession of engineering is built. The prospective engineering student must acquire the best possible background of mathematics in elementary school, junior high, and high school. The emphasis should be on algebra, geometry, trigonometry, and analytic geometry so that a student entering engineering school will be able to start with analytic geometry and calculus. Mathematics courses should be deep and rigorous and preferably of modern design. One year of chemistry is required, and a year of physics is highly desirable. Biology is advantageous but should not be selected in preference to either physics or chemistry. Science courses should stress concepts and methods of science rather than the wonders of science.

The prospective engineer is educated not for engineering alone but also for becoming an adult member of society. This requires an understanding of society, its culture, and its origin; such an understanding can be gained partially by the study of literature, history, economics, the arts, and other branches of humanities and social sciences. Preparatory courses of high intellectual quality in these areas are necessary for all candidates for university-level education.

Applicants are admitted to curricula in the School of Engineering by the Engineering Admissions Committee after satisfactory performance in the appropriate freshman program. Applicants for admission to Aerospace, Chemical, Civil, Electrical, Industrial, Materials, Mechanical, and Textile Engineering, as well as Textile Chemistry, will be approved upon completion with satisfactory grades of prescribed courses in mathematics through MH 162; English Composition, 9 hours; chemistry, 10 hours; engineering graphics, 2 hours; industrial laboratories, 2 hours; and physical education, 3 hours.

Admission to Aviation Management and Textile Management will be approved upon satisfactory completion of 47 quarter-hours of work including all prescribed freshman work in English, mathematics, engineering graphics, physical education, industrial laboratories, and chemistry. *A student who has not proceeded from Pre-Engineering to his field of major interest in engineering after the completion of six quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering.*

**Engineering Curricula.** — Curricula offered are designed to meet the educational requirements of the engineering profession. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses follow in the third and fourth years. A parallel program emphasizing the humanistic-social studies, including history, literature, economics, philosophy and similar courses is followed throughout the four years having as its objective a good general education for the engineering student.

Curricula accredited by the Engineers' Council for Professional Development lead to the degrees of Bachelor of Aerospace Engineering, Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bach-

elor of Electrical Engineering, Bachelor of Industrial Engineering, and Bachelor of Mechanical Engineering. An accredited curriculum in Agricultural Engineering is offered by the School of Agriculture.

A curriculum in Materials Engineering leads to the degree of Bachelor of Materials Engineering. This curriculum is administered through the Department of Mechanical Engineering.

A curriculum in Textile Engineering leads to the degree of Bachelor of Textile Engineering. A curriculum in Textile Chemistry leads to the degree of Bachelor of Textile Chemistry. This latter curriculum is designed to train students in the chemistry of man-made fibers and in the theory and practice of textile dyeing and finishing.

**Management Curricula.** — Two management curricula leading to the degrees of Bachelor of Aviation Management and Bachelor of Textile Management prepare young men and women for a wide range of administrative and managerial positions in industry. The program of study in the freshman year provides a period of orientation, guidance, and selection. Freshmen are registered in the Pre-Engineering Program as Pre-Engineering Management students, and are admitted to management curricula upon successful completion of the freshman program as outlined above.

**Graduate Degrees.** — Master of Science degrees are offered in the areas of Aerospace Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. The Doctor of Philosophy degree is offered in the areas of Electrical Engineering and Mechanical Engineering. For requirements for these degrees, see the Graduate School Bulletin.

**Service Departments.** — The Departments of Engineering Graphics and Industrial Laboratories are service departments to the School of Engineering. However, the courses offered in these departments may also be taken by students in other schools who may find them useful in their particular fields. The Department of Industrial Laboratories, in cooperation with the School of Education, offers a program for the professional and technical training of Industrial Arts teachers for elementary and secondary schools. (See School of Education for major and minor requirements.)

**Co-operative Education Program.** — The Co-operative Education Program is offered in all curricula of the School of Engineering. Refer to page 46 for a brief description of the program and write to the Director, Co-operative Education, Auburn University, Auburn, Alabama 36830, for a booklet which gives additional information.

**Engineering Extension Service.** — The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service take the form of short courses, conferences, clinics, and seminars. For further information, write to the Director, Engineering Extension Service, 107 Ramsay Hall.

## Auburn School of Aviation

ROBERT G. PITTS, *Director*

The Auburn School of Aviation was established in 1942 as a department of the School of Engineering to offer flight and ground school instruction in aircraft piloting for resident and extension students of the University, for the Armed Forces, and for the general public; and to serve the citizens of Alabama and the Southern Region by providing other services in the broad field of aviation. The School cooperates fully with the Federal Aviation Agency in conducting special aviation training programs. At the present time the school is conducting a flight program for the training of private, commercial, multi-engine, and instrument pilots and flight instructors.

The University is exceptionally well equipped to conduct pilot training programs inasmuch as it owns a large modern airport of 325 acres conveniently located within two miles of the campus. The landing field has two paved runways 4,000 feet long. Other facilities include two large hangars and a modern Administration Building.

In addition to the training of pilots, such other public service accommodations as airplane storage, servicing, maintenance, and repair are provided at the airport. In conjunction with the Aerospace Engineering Laboratories located on the campus, the operation at the airport serves as an excellent laboratory of practical training for students enrolled in the curricula of Aviation Management and Aerospace Engineering. Because of the excellent aviation facilities, the University has been fully certified by the Federal Aviation Authority as an Approved Ground and Flight School and has examining authority for private pilots.

The Director of the Auburn School of Aviation is an Aircraft Inspection Representative for the Federal Aviation Agency.

## Pre-Engineering

HOWARD STRONG, *Assistant to the Dean for Pre-Engineering*

The Pre-Engineering Program consists of a freshman program of studies to prepare students for admission to the School of Engineering with sophomore standing. This program is designated Pre-Engineering Management for students in the management curricula, Pre-Chemical Engineering for students in the Chemical Engineering curriculum, and Pre-Engineering for all other curricula.

The freshman Pre-Engineering curriculum shown below is uniform for seven Engineering curricula: namely, Aerospace, Civil, Electrical, Industrial, Materials, Mechanical, and Textile Engineering. It and the Pre-Chemical Engineering curriculum are both designed for students whose High School records and ACT or College Board (SAT) scores indicate that they are capable of being successful in Mathematics 161, English 101, Chemistry 103, and Engineering Graphics 106 during their first quarter in school. *Students required to schedule courses below these levels in mathematics, English and/or chemistry, are expected to plan with the assistance of the Assistant to the Dean for Pre-Engineering.*



a program of work depending upon their aptitude and extent of high school preparation.

A student who has not proceeded from Pre-Engineering to his field of major interest in engineering after the completion of six quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering. Furthermore, Junior standing cannot be granted to any student in the Pre-Engineering Program regardless of the number of hours completed.

### Three-Quarter Pre-Engineering Curriculum

First Quarter		Second Quarter		Third Quarter	
MH 161	Anal. Geom. & Cal. .5	MH 162	Anal. Geom. & Cal. .5	MH 163	Anal. Geom. & Cal. .5
CH 103	Founds. of Chemistry I .4	CH 104	Founds. of Chemistry II .4	PS 220	Gen. Physics I .4
CH 103L	Gen. Chem. Lab. .1	CH 104L	Gen. Chem. Lab. .1	EH 103	English Comp. .3
EH 101	English Comp. .3	FH 102	English Comp. .3	HY 101	World History .3
EG 106	Graphical Meth. .2	IL 100	Intr. to Mfg. Proc. .2	MS	Military Training .1
MS	Military Training .1	MS	Military Training .1	PE	Physical Education .1
PE	Physical Education .1	PE	Physical Education .1		

## Curricula in Engineering

**Humanistic-Social Studies.** — The engineer must be more than a specialist. If he is to function effectively in his profession for the benefit of society, he must be aware of the social and humanistic implications of his activities and be equipped to assume his responsibilities in these areas. To assist him in this preparation, the various engineering curricula are arranged so that a student will take approximately 30 quarter-credit hours of humanistic-social studies. Some of the courses are prescribed while others must be selected by the student from an approved list. In addition to the specified courses in English Composition and World History, the University requires that the student take at least one course from each of the areas of Humanities and Social Sciences. The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum. The Humanistic-Social Electives shall be selected from meaningful sequences, whenever possible, the details of such approved sequences and courses being available in the offices of the Assistants to the Dean and the Department Heads. Other sequences may be elected with the approval of the student's Department Head. A variety of sequences in the Humanities and the Social Sciences are available in the areas listed below:

### Humanities

Fine Arts  
History

Literature  
Philosophy

### Social Sciences

Anthropology  
Economics  
Political Science

Psychology  
Psychology — Sociology  
Sociology

## Aerospace Engineering

The curriculum in Aerospace Engineering provides an especially good educational background for those wishing to enter the many areas of today's major scientific effort — conquest of space. It also places emphasis on conventional aircraft, missiles and aero-propulsion systems.

The first two years of the curriculum are devoted to the basic subjects of mathematics, physics and mechanics. The last two years deal with such broad areas as aerodynamics, design, propulsion, structures and space science. During the senior year students may schedule technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as an excellent background for graduate work and research.

## Curriculum in Aerospace Engineering (AE)

### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

### SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
MH 264	Anal. Geom. & Cal. 5	MH 265	Diff. Equat. 3	AE 300	Aerospace Anal. I 3
PS 221	General Physics II (Lab.) 4	PS 222	General Physics III (Lab.) 4	EE 262	Circuits 3
ME 205	Applied Mechanics - Statics 4	ME 321	Dynamics I 4	ME 207	Strength of Materials I 3
AE 203	Aerospace Fundamentals (Lab.) 3	ME 301	Thermodynamics I 4	ME 340	Fluid Mechanics I 3
MS	Military Training 1	HY 102	World History 3	HY 103	World History 3
		MS	Military Training 1	MS	Military Training 1

### JUNIOR YEAR

EE 273	Electronic Devices 3	EE 381	Electromag. Devices (Lab.) 4	AE 409	Aero. Struct. II (Lab.) 5
AE 302	Airloads (Lab.) 4	PS 320	Modern Physics 3	AE 311	Aero. Mat. & Meth. of Construction 3
AE 303	Theor. Aero. I 3	AE 304	Theor. Aero II (Lab.) 4	AE 439	Static Stability & Control (Lab.) 3
AE 307	Aero. Struct. I (Lab.) 5	AE 305	Flight Performance 2	AE 415	Jet Propulsion 5
ME 202	Engr. Mat. Sci.-Structure 3	AE 310	Aero. Anal. II 4		*Hum.-Soc. Elective 3

### SENIOR YEAR

AE 432	Astro dynamics I 3	AE 433	Astro dynamics II 3	AE 449	Aero. Design II (Lab.) 1
AE 400	Viscous Aero. (Lab.) 4	AE 448	Aero. Design I (Lab.) 1	AE 402	Aero. Problems II 1
AE 429	Aircraft Vibration & Flutter 5	AE 434	Aero. Sys. Anal. 3		Technical Electives 6
AE 441	Dynamic Stab. & Control 3	AE 401	Aero. Problems I 3		*Hum.-Soc. Electives 8
	*Hum.-Soc. Elective 3		Technical Elective 3		
			*Hum.-Soc. Electives 6		

**Total — 208 quarter hours**

\*See page 141 for the selection of Humanistic-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

### SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 335	Rotary Wing Aerodynamics 3	AE 428	Space Propulsion Systems 5
AE 414	Equilibrium Gas Dynamics 3	AE 435	Elements of V/STOL Flight 3
AE 416	Rocket Propulsion I 3	AE 442	Automatic Stability & Control 3
AE 417	Rocket Propulsion II 3	AE 445	Missile Aerodynamics 3
AE 420	Flight Vehicle Structures I 3	ME 421	Heat Transfer 4
AE 421	Flight Vehicle Structures II 3	ME 422	Transport Phenomena 3
AE 424	Nonequilibrium Gas Dynamics 3	PS 403	Nuclear Physics 3

## Aviation Management

The curriculum in Aviation Management provides education for men and women who plan management careers with the airlines, general aviation, manufacturing, governmental agencies or the military services. The study of fundamental aerospace courses is combined with specified subjects in industrial engineering, business management and selected electives to provide preparation for the various specific functions of the aerospace industries including general management, production, opera-

tions, flying, maintenance, and education and training. It also provides a broad educational background of fundamental philosophies, theories, and concepts needed for research and study at the graduate levels.

### Curriculum in Aviation Management (AA)

#### FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp. — 3	EH 102	English Comp. — 3	EH 103	English Comp. — 3
HY 101	World History — 3	HY 102	World History — 3	HY 103	World History — 3
MH 160	Algebra & Trig. — 5	MH 161	Anal. Geom. & Cal. — 5	MH 162	Anal. Geom. & Cal. — 5
IL 102	Weld. Sci. & App. — 1	IL 103	Machine Tool Lab. — 1	IL 104	Sheet Metal — 1
EG 102	Engr. Drawing I — 2	EG 104	Descrip. Geom. — 2	EG 105	Engr. Drawing II — 2
MS	Military Training — 1	MS	Military Training — 1	MS	Military Training — 1
PE	Physical Education — 1	PE	Physical Education — 1	PE	Physical Education — 1

#### SOPHOMORE YEAR

EC 200	Gen. Economics — 5	AA 202	Aerospace History — 3	PO 206	U.S. Government — 5
IE 201	Indus. Admin. — 3	EC 274	Statistics — 5	+SP 202	Oral Communica. — 3
AA 201	Elem. Aeronaut. — 5	PS 206	Intr. Physics — 5	EC 215	Fund. Gen. & Cost Accounting — 5
PS 205	Intr. Physics — 5	IE 204	Computer Program — 3	PG 211	Psychology I — 3
MS	Military Training — 1	MS	Military Training — 1	MS	Military Training — 1

#### JUNIOR YEAR

AA 311	Propul. Funda. — 5	AA 312	Guidance & Control Funda. — 5	AA 309	Aerospace Legislation — 3
EC 341	Business Law — 5	EH 304	Technical Writ. — 3	EC 300	Business Organ. & Management — 5
AA 305	Aviation Meteorology — 5	IE 302	Prod. Control Techniques — 3	IE 320	Engr. Economy — 5
IE 316	Electronic Data Processing Sys. — 4	IE 310	Motion & Time Study — 5	AA 337	Air Transport — 5

#### SENIOR YEAR

PG 461	Indus. Psychol. — 5	AA 417	Airline Operat. — 5	AA 402	Aerospace Vehicle Systems — 5
AA 416	Airport Mgt. — 5	EC 442	Personnel Mgt. — 5	EC 445	Indus. Relations or
	Technical Elective — 5		Technical Elective — 5	EC 400	Indus. Mgt. — 5
	*Hum.-Soc. Elective — 4		*Hum.-Soc. Elective — 3	AA 401	Aeronautical Seminar — 1
					Technical Elective — 5

Total — 207 quarter hours

†Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and three additional hours of Humanistic-Social Electives, or 6 hours of Humanistic-Social Electives.

\*See page 141 for the selection of Humanistic-Social Electives. Technical Electives must be approved by the Department Head.

## Chemical Engineering

The rapidly growing chemical industry in the southern region, and more particularly in Alabama, is providing exceptional opportunities for chemical engineering graduates to obtain employment in familiar surroundings and to contribute to the economy and well-being of the state.

Simply stated, the chemical engineer is responsible for producing a chemical product. This may be an individual compound such as an acid, a base or a gas or it may be an industrial product such as paper, synthetic fibers, polymers, fertilizers, various agricultural chemicals, petrochemicals or petroleum products.

The program leading to the bachelor's degree in chemical engineering consists almost entirely of broad scientific and engineering principles which have numerous applications in the chemical and related industries. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design and management.

The curriculum in chemical engineering is offered under both the regular and the co-operative plan. See the Co-operative Education program.

### Curriculum in Chemical Engineering (CN)

First Quarter			Second Quarter			Third Quarter		
CH 111	Gen. Chemistry	5	CH 112	Gen. Chemistry	5	CH 113	Gen. Chemistry	5
MH 161	Anal. Geom. & Cal.	5	MH 162	Anal. Geom. & Cal.	5	MH 163	Anal. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
EG 106	Graphical Methods	2	IL 100	Intro. to Manufac- turing Proc.	2	HY 101	World History	3
MS	Military Training	1	MS	Military Training	1	MS	Military Training	1
PE	Physical Education	1	PE	Physical Education	1			
SOPHOMORE YEAR								
CN 101	Chemical Engr. Fundamentals	1	PS 221	General Physics II	4	CN 200	Computers in Chemical Engr.	2
ME 202	Engr. Materials Sci.-Structures	3	CH 303	Organic Chem.	5	CH 304	Organic Chem.	5
MH 264	Anal. Geom. & Cal.	5	MH 265	Differential Equations	3	MH 266	Linear Algebra	3
PS 220	General Physics I	4	HY 103	World History	3	PS 222	General Physics III	4
HY 102	World History	3	IE 211	Engr. Statistics I	3	MS	*Hum.-Soc. Elective	3
MS	Military Training	1	MS	Military Training	1	MS	Military Training	1
PE	Physical Education	1						
JUNIOR YEAR								
CN 301	Material & Energy Balances	5	CH 408	Physical Chem.	5	CN 326	Energy Transport	5
CH 407	Physical Chem.	5	CH 302	Chem. Engr. Anal.	3	CN 430	Analog Computation	2
MH 362	Engr. Math.	3	CN 324	Momentum Trans- port	3	CN 390	Intr. to Chem. Engr. Thermody- namics	3
ME 205	Applied Mechanics —Statics	4	ME 207	Strength of Mate- rials I	3	PS 320	Modern Physics	3
			EE 262	Circuits	3	MS	*Hum.-Soc. Elective	4
SENIOR YEAR								
CN 423	Stagewise Operations	4	CN 401	Chem. Engr. Eco- nomics	3	CN 491	Applied Kinetics	4
CN 432	Process Dynamics & Control	5	CN 424	Mass Transport	5	CN 484	Chem. Eng. Design	4
CN 490	Chem. Engr. Thermodynamics	5	CN 437	Process Engr.	4	CN 470	Seminar	1
	*Hum.-Soc. Elective	3		*Hum.-Soc. Elective	5		Technical Elective	3
							*Hum.-Soc. Elective	5

### Total — 208 quarter hours

\*See page 141 for the selection of Humanistic-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

### SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CN 322	Chemical Process Industries	5	CN 460	Introduction to Plastics	3
CN 440	Nuclear Engineering	5	CN 475	Kinetics and Transformations	3
CN 450	Special Topics in Chemical Engr.	TBA			

## Civil Engineering

The Civil Engineering curriculum provides a sound training in mathematics and the physical sciences, in the applied sciences and principles of civil engineering, in a limited number of technical electives, and in humanistic-social studies. The curriculum prepares the graduate for further training by his employer and for the eventual practice of civil engineering. Courses in mathematics and the physical sciences constitute the foundation upon which the successful professional training

is built. Technical electives provide for limited specialization in some branch of civil engineering such as highway, hydraulic, sanitary, soils, soils or structural engineering.

Training in civil engineering may lead to professional activities in analysis, design, research, construction, production or sales. Such activities may be directly or indirectly concerned with highways, railroads, dams, and appurtenant structures, rivers, harbors, water supply, sewage disposal, industrial wastes, foundations, buildings, bridges, etc.

The civil engineer holds a leading role in the development of our country. As in most of the professions, great changes are taking place in methods and equipment. The civil engineer will take full advantage of recent advancements in science.

### Curriculum in Civil Engineering (CE)

#### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

#### SOPHOMORE YEAR

##### First Quarter

MH 264	Anal. Geom. & Cal.	5
ME 205	Statics	4
ME 202	Mths. Science	3
PS 221	General Physics II	4
MS	Military Training	1

##### Second Quarter

MH 265	Diff. Equations	3
HY 102	World History	3
IE 205	Comp. Prog.	3
CE 201	Surveying I	5
PS 222	General Physics III	4
MS	Military Training	1

##### Third Quarter

EC 200	Economics	5
HY 103	World History	3
ME 321	Dynamics I	4
CE 203	Surveying II	4
MS	Military Training	1

#### JUNIOR YEAR

EE 262	Circuits	3
ME 207	Strength of Mat. I	3
CE 320	Hwy. Engr. I	5
ME 301	Thermodynamics I	4
PS 320	Modern Physics for Engrs.	3

ME 340	Fluid Mechanics I	3
EE 273	Elec. Devices	3
CE 304	Theo. of Struc. I	5
CE 303	Str. Materials	3
	*Hum.-Soc. Elective	3

IE 211	Engr. Statistics I	3
IE 320	Engr. Economy	5
CE 380	Theo. of Struc. II	5
CE 308	Hydraulics	5

#### SENIOR YEAR

CE 404	Reinf. Concrete	4
CE 305	Water Supply	5
	*Hum.-Soc. Elective	3
EC 206	Econ. Foundations	3
	Tech. Elective	3

CE 414	Struct. Design	3
CE 314	Photogeology	5
CE 405	Water Treatment	5
CE 418	Soil Mechanics	5

CE 408	Engr. Foundations	3
CE 422	Seminar	1
	Tech. Elective	6
	*Hum.-Soc. Elective	6

### Total — 209 quarter hours

\*See page 141 for the selection of Humanistic-Social Electives.

Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

#### SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CE 400	Higher Surveying	5	CE 424	Air Pollution	3
CE 402	Statistically Indeterminate Structures	5	CN 440	Nuclear Engineering	5
CE 407	Municipal Engineering I	3	EE 322	Logic & Computing Systems	3
CE 409	Environmental Health Engineering	5	EE 381	Electromagnetic Devices	4
CE 410	Highway Engineering II	5	ME 304	Engr. Materials Science — Properties	3
CE 411	Flow in Open Channels	5	ME 335	Engr. Materials Science — Physical Metallurgy	4
CE 412	Hydrology	5	MH 362	Engineering Mathematics I	3
CE 413	Hydraulic Structures	5	MH 404	Engineering Mathematics III	5
CE 415	Construction Planning	5	MH 460	Numerical Analysis I	5
CE 417	Structural Design II	5	MH 461	Numerical Analysis II	5
CE 419	Municipal Engineering II	3	PS 401	Theoretical Physics I — Mechanics	5
CE 420	Sanitary Engineering Laboratory	5	PS 402	Theoretical Physics II — Mechanics	5
CE 421	Water Resources Engineering	5	PS 405	Nuclear Physics	5
CE 423	Similitude in Engineering	3			

### Electrical Engineering

The curriculum in Electrical Engineering keeps pace with significant developments in science and technology; provides an educational

preparation that assures maximum rate of progress in the engineering profession; and does this within the framework of a sound and extensive humanistic social program.

The Electrical Engineering curriculum is organized around four basic areas of study. These areas provide a firm background in the basic concepts required for all Electrical Engineering students. They are (1) Circuit Analysis, (2) Electronics and Communication, (3) Energy Conversion and Transmission, and (4) Electromagnetic Fields. Courses in automatic control and logic and computing systems are also required. In addition, the senior year of the curriculum is arranged so that a student, through his choice of technical electives, can concentrate on topics of individual interest. Included in these specialized topics are closed-loop control systems, analog and digital computers, generation and transmission of electrical power, advanced communications systems, solid state electronics, and network synthesis.

Many required courses have associated laboratories, in order to keep the student in maximum contact with the realities of the practice of engineering.

### Curriculum in Electrical Engineering (EE)

#### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

#### SOPHOMORE YEAR

##### Second Quarter

First Quarter	
MH 264 Anal. Geom. & Cal.	5
PS 221 General Phys. II	4
HY 102 World History	3
ME 202 Eng. Maths. Sc.— structures	3
IE 205 Comp. & Info. Sys.	3
MS Military Training	1

MH 265 Linear Diff. Eq.	3
PS 222 General Phys. III	4
HY 103 World History	3
ME 205 Appl. Mech.—Statics	4
EE 262 Circuits	3
MS Military Training	1

##### Third Quarter

MH 362 Engr. Math. I	3
IE 211 Engr. Statistics I	3
EE 275 Electronic Devices	3
ME 321 Dynamics I	4
*Hum.-Soc. Elective	3
MS Military Training	1

#### JUNIOR YEAR

EE 361 Network Analysis	5
EE 381 Electromag. Devices	4
EE 391 Electromag. I	4
ME 301 Thermodynamics I	4

EE 362 Linear Systems	5
EE 372 Electronics I	4
EE 392 Electromag. II	4
EE 322 Logic & Computing Systems	3
*Hum.-Soc. Elective	3

EE 375 Electronics II	5
EE 383 Electromech. Energy Conversion	4
EE 393 Electromag. III	5
Engr. Science Elective	3

#### SENIOR YEAR

EE 471 Comm. Theory	5
PS 320 Mod. Phy. for Engr.	3
Engr. Science Elective	3
Tech. Elective	3
*Hum.-Soc. Elective	3

EE 412 Elect. Prop. of Matl.	3
EE 452 Auto Feedback Control Sys.	5
Tech. Elective	3
*Hum.-Soc. Electives	6

EE 413 Phys. Electronics	3
Tech. Elective	3
*Hum.-Soc. Electives	6
†Free Electives	6

### Total — 210 quarter hours

†Six hours of Advanced ROTC may be substituted for the six hours of Free Electives.

\*See page 141 for the selection of Humanistic-Social Electives.

#### SUGGESTED ENGINEERING SCIENCE ELECTIVES

In addition to the courses listed below, other subjects may be used as engineering science electives upon approval of the Head of the Department.

EE 324 Digital Systems	3	EE 446 Analog Computers	3
EE 424 Computer Applications in Electrical Engineering	3	IE 305 Information Decision Systems	3
EE 425 Computer Organization	3	ME 207 Strength of Materials I	3
		ME 340 Fluid Mechanics I	3

#### SUGGESTED TECHNICAL ELECTIVES

In addition to the courses listed on following page, other subjects may be used as technical electives upon approval of the Head of the Department.



EE 324 Digital Systems	3	IE 416-7 Operations Analysis III-IV	3-3
EE 424 Computer Applications in Electrical Engineering	3	ME 207 Strength of Materials I	3
EE 425 Computer Organization	3	ME 340 Fluid Mechanics I	3
EE 446 Analog Computers	3	ME 401 Statistical Thermodynamics	3
EE 447 Magnetic Devices	3	ME 402 Introduction to Optimal Systems	3
EE 454 Introduction to Modern Control Theory	3	ME 421 Heat Transfer	4
EE 455 Automatic Control Instrumentation	3	ME 422 Transport Phenomena	3
EE 464 Introductory Network Synthesis	3	MH 220-1-2 Introduction to Analysis I-II-III	5-5-5
EE 465 Advanced Circuit Analysis	3	MH 266 Topics in Linear Algebra	3
EE 473 Communication Systems	3	MH 401 The Calculus of Vector Functions	3
EE 474 Solid State Electronics	3	MH 403 Engineering Mathematics II	5
EE 485 Power Systems Engineering	4	MH 405 Matrix Theory and Applications	5
EE 486 Direct Energy Conversion	3	MH 460 Introduction to Numerical Analysis	5
EE 494 Electromagnetic Propagation	3	MH 461 Numerical Matrix Analysis	5
EE 495 Microwaves	3	PS 305 Introduction to Modern Physics	5
EE 496 Antennas	3	PS 401-2-3 Theoretical Physics I-II-III	5-5-5
IE 312-3 Engineering Statistics I-II	3-3	PS 404 Thermodynamics	5
IE 314-5 Operations Analysis I-II	3-3	PS 415 Introduction to Quantum Mechanics	5
IE 325-6 Engineering Economics Analysis I-II	5-3	PS 435 Introduction to Solid State Physics	5

## Industrial Engineering

The curriculum in Industrial Engineering prepares one for employment in the design, operation, and control of systems involving men, machines, and materials. Emphasis is placed upon those areas of academic education which are fundamental and pertinent to production and manufacturing; however, the factfinding and analysis approach of Industrial Engineering is applicable to almost any business or service enterprise.

To provide the scientific base required for Industrial Engineering, the student takes sequences of courses in mathematics, physics, chemistry, and engineering science. Part of the engineering science courses are offered through an elective-option arrangement. This base is utilized and reinforced by additional quantitative courses such as engineering statistics, computer programming, linear programming, simulation, and operations research. The economic and human aspects of Industrial Engineering are also recognized through appropriate subjects. Application of this fundamental knowledge is made in courses such as inventory control, production control, budget control, and operations and facilities design.

The philosophy of the Department of Industrial Engineering is to train the student to recognize and solve industrial problems with the most efficient tools available. To the extent possible, this curriculum provides and demonstrates by application the fundamental principles and techniques of Industrial Engineering.

### Curriculum in Industrial Engineering (IE)

#### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

#### SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
MH 264 Anal. Geom. & Cal.	5	PS 222 Gen. Physics III	4	EC 215 Gen. & Cost Acc.	5
PS 221 Gen. Physics II	4	MH 265 Diff. Equations	3	IE 205 Com. & Info. Sys.	3
HY 102 World History	3	HY 103 World History	3	IE 211 Engr. Stat. I	3
IE 202 Ind. Processes	3	ME 202 EMS-Structure	3	ME 321 App. Mch. Dynam.	4
MS Military Training	1	ME 205 App. Mech. Stat.	4	EE 262 Circuits	3
		MS Military Training	1	MS Military Training	1

First Quarter			JUNIOR YEAR			Second Quarter			Third Quarter		
ME 207	Stren. of Mat. I	3	IE 305	Info-Decis. Sys.	3	IE 326	Eng. Eco. Anal. II	3	EE 326	Eng. Eco. Anal. II	3
PG 211	Gen. Psychology	3	IE 313	Engr. Stat. III	3	EE 381	Elec. Devices	4	IE 315	Oper. Anal. II	3
IE 312	Engr. Stat. II	3	IE 314	Oper. Anal. I	3	IE 318	Work Design I	3	IE 363	Man-Mach. Sys. I	3
IE 325	Engr. Eco. Anal. I	3	MH 266	Linear Algebra	3	IE 318	Work Design I	3	†Engr. Sci. Elective	3	
EE 273	Elec. Devices	3	PG 321	Exp. Psychology	3	IE 363	Man-Mach. Sys. I	3			
	*Hum.-Soc. Elective	3		*Hum.-Soc. Elective	3						
			SENIOR YEAR								
ME 301	Thermodynam. I	4	IE 417	Oper. Anal. IV	3	PS 320	Modern Physics	3			
IE 414	Engr. Stat. II	3	IE 424	Prod. Cont. Fund.	3	IE 428	Oper. & Fac. Des. II	3			
IE 416	Oper. Anal. III	3	IE 427	Oper. & Fac. Des. I	3	IE 429	Op. Cont. Sys. Des.	3			
IE 419	Work Design II	3		†Engr. Sci. Elective	3		†Engr. Sci. Elective	3			
IE 426	Ind. Bud. Cont.	3		*Hum.-Soc. Elective	3		*Hum.-Soc. Elective	3			

### Total — 208 quarter hours

\*See page 141 for the selection of Humanistic-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

†An Engineering Science Elective Sequence must be selected from a list of such sequences which is available in the Office of the Department Head. Of this, one course may be selected from junior or senior level Industrial Engineering, Mathematics or Physics courses with Department Head approval.

## Mechanical Engineering

Students who complete the curriculum in Mechanical Engineering have a broad field from which to select their life's work. Industrial positions in manufacturing, marketing, maintenance, and design are available to graduate mechanical engineers in a large variety of companies which produce mechanical, chemical, electrical, aerospace, nautical, and petroleum products. In addition, the graduate is prepared by his college training, when supplemented by experience and practical training, to specialize in management or in engineering services, such as consulting and sales. The curriculum also is suitable for students intending to enter the fields of engineering education and research. It is an excellent base for further study at the graduate level in this and allied fields.

The curriculum provides the student with a strong background in mathematics and the physical sciences. The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth to provide the student with understanding and with the ability to solve problems in these areas. In addition, professional training is given in combustion engines, including gas turbines and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical theory and electronics is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the case study and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and co-operation in creative design and optimization and in the use of analysis and synthesis.

Humanistic-social subjects are required to give the student breadth and to add to his general education.

Technical electives are provided in the senior year of the curriculum to enable students to specialize to a limited extent. Students intending to undertake graduate studies may take additional mathematics in lieu of certain professional technical electives.

## Curriculum in Mechanical Engineering (ME)

## FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

## SOPHOMORE YEAR

## First Quarter

## Second Quarter

## Third Quarter

PS 221 General Physics II —4	ME 202 Engr. Materials Science-Structure —3	EE 262 Circuits —3
MH 264 Anal. Geom. & Calculus —5	ME 207 Strength of Materials I —3	ME 316 Strength of Materials II —4
ME 205 Applied Mechanics-Statics —4	PS 222 General Physics III —4	ME 321 Dynamics I —4
HY 102 World History —3	HY 103 World History —3	ME 308 Computation Lab. —2
MS Military Training —1	MH 265 Linear Differential Equations —3	MH 266 Topics in Linear Algebra —3
	ME 210 Engineering Method —1	ME 309 Materials Testing Laboratory —1
	MS Military Training —1	MS Military Training —1

## JUNIOR YEAR

ME 322 Dynamics II —4	ME 304 Engr. Materials Science-Properties —3	ME 335 Engr. Materials Science-Metallurgy —4
ME 301 Thermodynamics I —4	ME 302 Thermodynamics II —3	ME 303 Thermodynamics III —3
MH 362 Engr. Math I —3	EE 381 Electromag. Dev. —4	PS 320 Modern Physics for Engineers —3
EE 273 Electronic Devices —3	ME 340 Fluid Mechanics I —3	ME 341 Fluid Mechanics II —4
SP 202 Applied Oral Communication —3	ME 323 Dynamics of Machines —4	ME 312 Measurements Lab. —3

## SENIOR YEAR

ME 421 Heat Transfer —4	ME 415 Thermodynamics of Power Systems —4	ME 451 Advanced Projects —3
ME 439 Mech. Engr. Design I —4	ME 440 Mech. Engr. Design II —3	ME 420 Thermal Systems Laboratory —2
ME 427 Dynamics of Physical Sys. —4	ME 422 Transport Phenomena —3	*Hum.-Soc. Elective —9
*Hum. Soc. Elective —3	*Hum.-Soc. Elective —6	Technical Elective —4
Technical Elective —3	Technical Elective —3	

Total — 210 quarter hours

\*Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and three additional hours approved by the Department Head.

\*See page 141 for the selection of Humanistic-Social Electives.

## SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CE 304 Theory of Structures I —5	ME 428 Air Conditioning and Refrigeration —4
CE 305 Water Supply and Disposal Systems —5	ME 432 Automatic Controls —3
CE 402 Statistically Indeterminate Structures —5	ME 436 Engineering Materials Science-Ferrous Metallurgy —3
CE 404 Reinforced Concrete —4	ME 437 Engineering Materials Science-Non-Ferrous Metallurgy —3
CN 440 Nuclear Engineering —5	ME 438 Residual Stresses in Metals —4
EE 322 Logic and Computing Systems —3	ME 443 Photoelastic Stress and Strain Analysis —3
EE 391 Electromagnetics I —4	ME 450 Special Problems —1.5
IE 315 Operations Analysis II —3	MH 401 The Calculus of Vector Functions —3
IE 326 Engineering Economic Analysis II —3	MH 403 Engineering Mathematics II —5
IL 450 Engineering Metrology —1.5	PS 413 Introduction to X-Ray Crystallography —5
ME 401 Statistical Thermodynamics —3	
ME 402 Introduction to Optimal Systems —3	
ME 414 Turbomachines —4	
ME 425 Gas and Steam Turbines —4	

## Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an inter-disciplinary curriculum conducted co-operatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials Engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries. The profession of Materials Engineering is a modern out-growth of the older

professions of metallurgical, ceramic, and plastics engineering. It represents a unification of basic principles and experience in materials design to meet the expanding current needs for industrial materials. Every aspect of industrial and technological progress depends upon proper materials design and application.

The curriculum in Materials Engineering is planned to provide the necessary foundation in the humanities, basic sciences, engineering sciences, and particularly in the science of the relationship of structure to properties. The curriculum will prepare the engineer for professional practice or graduate study. Today, many materials engineers occupy key positions in industry, government, research and education.

The courses in Materials Engineering include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to effectively meet modern design challenges that will be encountered. The equipment available is comprehensive and modern and includes metallurgical microscopes, X-ray diffraction and radiographic facilities, an electron microscope, and a variety of types of chemical and mechanical processing and testing machines.

### Curriculum in Materials Engineering (MTL)

#### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

#### SOPHOMORE YEAR

##### First Quarter

MH 264	Anal. Geom. & Cal.	5
PS 221	Gen. Physics II	4
ME 205	Applied Mechanics— Statics	4
HY 102	World History	3
MS	Military Training	1

##### Second Quarter

MH 265	Linear Differential Equations	3
PS 222	Gen. Physics III	4
ME 202	Engr. Materials Science—Structure	3
ME 207	Strength of Materials I	3
HY 103	World History	3
MS	Military Training	1

##### Third Quarter

MH 266	Topics in Linear Algebra	3
CH 407	Physical Chem.	5
ME 304	Engr. Materials Science—Properties	3
ME 321	Dynamics I	4
ME 309	Materials Testing Laboratory	1
MS	Military Training	1

#### JUNIOR YEAR

CN 408	Physical Chem.	5
ME 335	Engr. Materials Science—Physical Metallurgy	4
CN 460	Intr. to Plastics	3
ME 308	Computation Lab.	2
	*Hum.-Soc. Elective	3

ME 301	Thermodynamics I	4
ME 336	Physical Analysis of Materials I	4
ME 436	Engr. Materials Science—Ferrous Metallurgy	3
ME 312	Measurements Lab.	3
	*Hum.-Soc. Elective	3

ME 421	Heat Transfer	4
ME 338	Phase Diagrams	4
ME 437	Engr. Materials Science—Non-ferrous Metallurgy	3
EE 262	Circuits	3
	Technical Elective	3

#### SENIOR YEAR

PS 320	Modern Physics for Engineers	3
CH 415	Polymer Tech.	4
ME 448	Intr. to Ceramics	3
EE 273	Electronic Devices	3
	*Hum.-Soc. Elective	3

PS 413	Intr. to X-Ray Crystallography	5
CN 475	Rate Processes in Materials	3
EE 381	Electromagnetic Devices	4
†SP 202	Applied Oral Communication	3
	Technical Elective	3

ME 446	Advanced Physical Metallurgy— Theoretical	3
	Metallurgy	3
ME 451	Advanced Proj.	3
	Technical Elective	3
	*Hum.-Soc. Elective	6

Total — 206 quarter hours

†Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and three additional hours approved by the Department Head.

\*See page 141 for the selection of Humanistic-Social Electives.

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

## SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CE 303 Structural Materials Testing	3	PS 301 Intermediate Electricity and Magnetism	5
CH 207 Organic Chemistry	5	PS 303 Optics	5
CH 410 Intermediate Inorganic Chemistry	5	PS 304 Applied Spectroscopy	5
EE 413 Physical Electronics	4	PS 414 Electron Optics and Microscopy	5
EE 443 Solid State Electronics	3	PS 415 Introduction to Quantum Mechanics	5
GE 301 Mineralogy I	5	PS 435 Introduction to Solid State Physics	5
ME 337 Physical Analysis of Materials II	4	TE 305 Fiber Technology	3
ME 438 Residual Stresses in Metals	3	TE 424 Man-Made Fibers I	5
ME 443 Photoelastic Stress & Strain Analysis	3		
ME 447 Advanced Physical Metallurgy—Plasticity	4		

## Textile Engineering

The Department of Textile Engineering is equipped with full-size machinery of a complete textile mill for the manufacture of a wide variety of fabrics from the processing of the raw material to the weaving of the finished product. Included are laboratories for bleaching, dyeing, finishing, and the physical and chemical testing of fibers and fabrics.

The textile industry is the largest industry in Alabama, comprising more than 25 per cent of the total industrial working force in the State. The greater portion of the textile industry, making yarn on the cotton system, is located in the South and Southeast. In the Southern Region alone, there are some 1500 plants which process cotton, rayon, nylon, wool, and paper and an almost unlimited number of finished products. The industry is growing rapidly in all branches.

The size and diversity of the textile and allied industries, including manufacturers of textile machinery and equipment, chemicals and dye-stuffs, research laboratories, textile supply and sales houses, afford unusual opportunities for college-trained men and women. New fields of employment are opening in research and development and in the process of new fibers. The need for college graduates in textile engineering has never been greater than at the present time, nor is the demand likely to be met within the next several years.

The Department of Textile Engineering offers three curricula to prepare students for all areas of the industry. The Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

**Textile Engineering.** — The curriculum in Textile Engineering trains men and women in the basic engineering sciences. It includes basic engineering sciences, humanistic-social studies, and textile subjects needed for a basic understanding of the textile industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the textile industry as well as in other allied industries, such as the manufacture of textile machinery and man-made fibers.

**Textile Chemistry.** — The curriculum in Textile Chemistry trains students in the chemistry of natural and man-made fibers and in the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other allied industries.

**Textile Management.** — The curriculum in Textile Management prepares the student for production, administrative and managerial positions in the textile and allied industries. Emphasis is placed on production and operational functions and the humanistic-social studies with the inclusion of textile subjects. Students are permitted in their junior and senior years to major in production, sales, or design according to their interests and professional needs.

The Alabama textile industry cooperates with the Department of Textile Engineering by assisting worthy young men and women to obtain a college education through the Cooperative Education Program, which is described on page 46 of this catalog.

The Department of Textile Engineering is organized and equipped to conduct applied and fundamental research. In cooperation with the Auburn Research Foundation, the Engineering Experiment Station, and other departments of the University, the department serves the textile industry of the region through the full utilization of its facilities.

### Curriculum in Textile Engineering (TE)

#### FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 141)

#### SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
TE 210	Fiber Process — 5	TE 101	Intr. Textiles — 1	TE 220	Weav. & Des. I — 5
MH 264	Anal. Geom. & Cal. — 5	MH 265	Linear Dif. Eq. — 3	ME 205	App. Mech. Statics — 4
HY 102	World History — 3	HY 103	World History — 3	ME 202	EMS-Structures — 3
PS 221	Gen. Physics II — 4	PS 222	Gen. Phys. III — 4	+SP 202	Oral Communica. — 3
MS	Military Training — 1	TE 211	Yarn Mfg. I — 5	MS	Military Training — 1
		MS	Military Training — 1		

#### JUNIOR YEAR

ME 207	Stren. Mtrls. I — 3	ME 321	Dynamics I — 4	ME 340	Fluid Mech. I — 3
EE 262	Circuits — 3	EE 273	Elec. Devices — 3	EE 381	Elec. Mag. D. — 4
TE 307	Bleach. & Dyeing — 5	TE 320	Weav. & Des. II — 5	TE 324	Phy. Testing — 3
TE 325	Text. Qual. Cont. — 2	PS 320	Mod. Phys./Engrs. — 3	TE 319	Chem. Testing — 2
ME 301	Thermodynamics I — 4	IE 201	Ind. Admin. — 3	IE 205	Com. & Info. Sys. — 3

#### SENIOR YEAR

TE 405	Warp Prepara. — 5	TE 406	Text. Costing — 5	TE 431	Fabric Analysis — 5
+EH 304	Tech. Writing — 3	TE 305	Fiber Technology — 3	TE 412	Text. Mgt. — 5
EC 200	Gen. Economics — 5	PG 211	Gen. Psychology — 3	TE 424	Man-Made Fibers — 5
	*Hum.-Soc. Elective — 5		Technical Elective — 5		*Hum.-Soc. Elective — 3
					Technical Elective — 5

### Total — 205 quarter hours

+Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and EH 304 (3 hrs.).

\*See page 131 for the selection of Humanistic-Social Electives.

#### SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

EC 341	Business Law — 5	IL 308	Gages & Measurements — 3
EC 402	American Industries — 5	TE 321	Weaving & Design III — 3
IE 301	Electronic Data Proc. — 5	MH 162	Anal. Geom. & Cal. — 5
IE 310	Motion & Time Study — 5	HY 102	World History — 3
IE 320	Engineering Economy — 5	TE 425	Man-Made Fibers II — 3

### Curriculum in Textile Chemistry (TC)

#### FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111	Gen. Chem. — 5	CH 112	Gen. Chem. — 5	CH 113	Gen. Chem. — 5
EH 101	English Comp. — 3	EH 102	English Comp. — 3	EH 103	English Comp. — 3
MH 160	Algebra & Trig. — 5	MH 161	Anal. Geom. & Cal. — 5	MH 162	Anal. Geom. & Cal. — 5
LY 101	Use of Library — 1	HY 101	World History — 3	HY 102	World History — 3
TE 101	Intr. Textiles — 1	MS	Military Training — 1	MS	Military Training — 1
MS	Military Training — 1	PE	Physical Education — 1	PE	Physical Education — 1
PE	Physical Education — 1				



## SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
CH 204	Anal. Chem. 3	CH 205	Anal. Chem. 5	PO 209	Intr. Am. Govt. 5
CH 204L	Anal. Chem. Lab. 2	MH 264	Anal. Geom. & Cal. 5	PA 202	Ethics & Soc. 5
MH 163	Anal. Geom. & Cal. 5	TE 220	Weav. & Des. I 5	TE 210	Fiber Process 5
HY 103	World History 3	MS	Military Training 1	TE 305	Fiber Tech. 3
†SP 202	Oral Communicat. 3			MS	Military Training 1
MS	Military Training 1				

## JUNIOR YEAR

PS 205	Intr. Physics 5	PS 206	Intr. Physics 5	CH 303	Organic Chem. 5
TE 320	Weav. & Des. II 5	TE 307	Bleach. & Dyeing 5	TE 317	Dyeing & Finish. 5
†EH 304	Technical Writ. 3	TE 211	Yarn Mfg. I 5	TE 319	Chem. Testing 2
PG 211	Gen. Psychology 3		*Hum.-Soc. Elective 3		Technical Elective 5

## SENIOR YEAR

CH 304	Organic Chem. 5	CH 407	Physical Chem. 5	CH 408	Physical Chem. 5
TE 405	Warp Preparation 5	TE 417	Adv. Dyeing 5	TE 406	Textile Costing 5
TE 412	Textile Mgt. 3	TE 424	Man-Made Fibers 5		Technical Elective 5
TE 324	Phys. Testing 3		Technical Elective 3		

## Total — 205 quarter hours

†Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and EH 304 (3 hrs.).

\*See page 141 for the selection of Humanistic-Social Electives.

## SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CH 305	Organic Chemistry 5	ME 301	Thermodynamics I 4
CH 404	Organic Anal. (Qual.) 5	MH 265	Diff. Equa. 3
CN 432	Proc. Dyn. & Control 5	TE 321	Weav. & Des. III 5
CN 460	Intro. to Plastics 3	TE 322	Yarn Mfg. II 5
IE 204	Computer Program 3	TE 418	Jacqu. Weav. & Des. 2
IE 211	Engr. Statistics I 3	TE 425	Man-Made Fibers II 5
IE 320	Engineering Economy 5	TE 431	Fabric Analysis 3
ME 207	Stren. of Mat. I 3		

## Curriculum in Textile Management (TM)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp. 3	EH 102	English Comp. 3	EH 103	English Comp. 3
HY 101	World History 3	HY 102	World History 3	HY 103	World History 3
MH 160	Intr. Col. Math. 5	MH 161	Anal. Geom. & Cal. 5	CH 200	Chem. Science 5
TE 101	Intr. Textiles 1	PA 202	Ethics & Soc. 5	PG 211	Intr. Psy. I 3
EG 102	Engr. Drawing 2	MS	Military Training 1	IL 103	Mach. Tool Lab. 1
MS	Military Training 1	PE	Physical Education 1	MS	Military Training 1
PE	Physical Education 1			PE	Physical Education 1

## SOPHOMORE YEAR

EC 200	Gen. Economics 5	EC 202	Economics II 5	EC 215	Fund. Acctng. 5
IE 201	Ind. Admin. 3	PS 204	Survey Physics 5	PO 209	Intr. Am. Govt. 5
TE 210	Fiber Process 5	TE 220	Weav. & Design 5	TE 211	Yarn Mfg. I 5
TE 305	Fiber Technology 3	MS	Military Training 1	MS	Military Training 1
MS	Military Training 1				

## JUNIOR YEAR

EC 274	Bus. & Eco. Stat. I 5	IE 301	El. Data Proc. 5	EC 331	Marketing 5
TE 307	Bleach. & Dyeing 5	TE 320	Weav. & Des. II 5	TE 317	Dyeing & Finish. 5
TE 322	Yarn Mfg. II 5	TE 324	Phys. Testing 3	TE 321	Weav. & Des. III 5
TE 319	Chem. Testing 2	†EH 304	Technical Writ. 3	TE 325	Tex. Qual. Cont. 2

## SENIOR YEAR

EC 445	Indus. Relat. 5	EC 442	Personnel Mgt. 5	TE 424	Man-Made Fibers 5
†SP 202	Oral Communicat. 3	TE 405	Warp Prepara. 5	TE 412	Textile Mgt. 3
TE 406	Text. Costing 5		Technical Elective 5	TE 431	Fabric Analysis 3
	Technical Elective 5		*Hum.-Soc. Elective 3	TE 418	Jacqu. Weav. & Des. 2
					Technical Elective 5

## Total — 204 quarter hours

†Six hours of Advanced ROTC may be substituted for SP 202 (3 hrs.) and EH 304 (3 hrs.).

\*See page 141 for the selection of Humanistic-Social Electives.

## SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

EC 212	Principles of Acctng. 5	IE 310	Motion and Time Study 5
EC 341	Business Law 5	IE 320	Engineering Economy 5
EC 463	Corporate Finance 5	IL 308	Gages and Measurements 5
EC 480	Bus. Pol. & Admin. 5	PG 461	Industrial Psychology 5
HE 415	History of Textiles 5	TE 417	Advanced Dyeing 5
IE 302	Prod. Cont. Techniques 3	TE 425	Man-Made Fibers II 5

# School of Home Economics

NORMA H. COMPTON, *Dean*

**H**OME ECONOMICS at Auburn University is a professional program with its roots in the arts, sciences and humanities. Areas of specialization are concerned with all aspects of environment, health and human development. Home Economics is a complex of studies serving many purposes — broad liberal education for the unknown future, preparation for professional careers, and a background for home and family living. A basic core of subjects in liberal education is required of all undergraduate majors. All courses are open to both men and women students.

With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or preprofessional preparation for an increasing variety of positions. The Home Economics degree enables graduates to earn above-average salaries. Numerous positions of leadership are offered to majors in education, business, industry, and government.

## *Programs*

Programs of study leading to the Bachelor of Science degree can be planned within eight curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests.

Each student is assigned a faculty adviser under whose guidance a program is planned.

The School of Home Economics includes the Departments of Family and Child Development, Consumer Affairs, and Nutrition and Foods.

### **Department of Family and Child Development**

The Department of Family and Child Development is concerned with the processes of growth and development of the individual in his daily living from infancy to old age and on the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources.

Two majors are offered in this department: Family Life and Early Childhood Education; Home Management and Family Economics.

#### ***Family Life and Early Childhood Education (FLE)***

The major in Family Life and Early Childhood Education prepares men and women for professional work with families and individuals of all age levels, with challenging careers in programs for young children and youth, social welfare, family life education and business. Through

the course, Internship in Agencies Serving Children, majors are provided supervised job experience related to their area of interest.

### Curriculum in Family Life & Early Childhood Education (FLE)

FRESHMAN YEAR			FRESHMAN YEAR			FRESHMAN YEAR		
First Quarter			Second Quarter			Third Quarter		
EH 101 English Comp.	3		EH 102 English Comp.	3		EH 103 English Comp.	3	
CA 116 Art for Everyday Liv.	3		CA 115 Clothing for Man	3		CA 113 Housing for Man	3	
BI 101 Prin. of Biology	4		BI 103 Gen. Animal Biology	4		FCD 257 Fam. & Human Dev.	3	
BI 101L Gen. Prin. of Bio. Lab.	1		BI 103L Gen. Animal Biology Lab.	1		PG 211 Psychology I	3	
NF 119 Nutrition and Man	3		MH 100 Mathematical Insights	5		PE Physical Education	1	
FCD 110 Contemporary H.Ec.	1		PE Physical Education	1		Approved Elective	5	
LY 101 Library Science	1							
PE Physical Education	1							
SOPHOMORE YEAR			SOPHOMORE YEAR			SOPHOMORE YEAR		
FCD 207 Prin. of Child Dev.	3		FCD 307 Growth & Dev. of Child	3		HY 103 World History	3	
HY 101 World History	3		FCD 307L Growth & Dev. Child Lab.	2		FCD 327 The Child in a Culturally Disadv. Family	5	
FED 213 Human Development	5		HY 102 World History	3		SP 270 Group Leadership	3	
Humanities Elective	3		SY 201 Sociology	5		Humanities Elective	3	
Approved Elective	3		Humanities Elective	3		Approved Elective	4	
JUNIOR YEAR			JUNIOR YEAR			JUNIOR YEAR		
FCD 437 Teaching Meth. Prepri. Ed.			FCD 317 Adol. in the Home	5		FCD 417 Guidance of Young Child	3	
or			PG 330 Social Psychology	5		FCD 417L Guid. of Young Child Lab.	2	
FCD 357 The Aged & His Fam.	5		FCD 323 Management for Mod. Liv.	3		NF 353 Comm. & Fam. Helath	3	
FCD 304 Home & Fam. Life	3		Approved Elective	5		Approved Elective	10	
EC 200 Gen. Economics	5							
Approved Elective	5							
SENIOR YEAR			SENIOR YEAR			SENIOR YEAR		
FCD 457 Family Relationships	5		FCD 467 Parent Education	5		FCD 497 Internship in Agencies Serv. Child & Fam.		
PG 433 Personality	5		CA 431 Man-Environment Relationships	2		or		
Approved Elective	8		Approved Elective	10		FCD 447 Directed Teaching Pre-primary Ed.		
						or		
						Other Approved Elective	5	
						Professional Elective	10	

Total — 210 quarter hours

### Child Study Laboratories

The Department of Family and Child Development provides three laboratories for the study of child development and human relations, two nursery schools for children three to five years of age and a kindergarten for five-year olds. The nursery school meets from 9:00 a.m. to 12 noon. A hot lunch is served to the three-year olds. The kindergarten is in session from 1 to 4 p.m. Children admitted to the child study laboratories are selected from an application list. Applications may be placed with the Department of Family and Child Development when the child is 1½ years old. Children are admitted on an early application basis and laboratory needs.

### Home Management and Family Economics (HME)

The Home Management and Family Economics major is designed for students interested in a broad general education in home economics.

Professional preparation is offered for positions in consumer economics, family economics, financial counseling, Cooperative Extension Service, home service and other areas of business, requiring a background in home management and social science. Valuable experience may be gained for graduate study.

### Curriculum in Home Management and Family Economics (HME)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
EH 101 English Comp.	3		EH 102 English Comp.	3		EH 103 English Comp.	3	
CA 116 Art for Everyday Living	3		CA 115 Clothing and Man	3		FCD 257 Fam. & Human Dev.	3	
MH 107 College Algebra	3		CH 103 General Chemistry	4		CH 104 General Chemistry	4	
NF 119 Nutrition and Man	3		CH 103L Chemistry Lab.	1		CH 104L Chemistry Lab.	1	
FCD 110 Contem. Home Ec.	1		HY 101 World History	3		HY 102 World History	3	
LY 101 Use of Library	1		CA 113 Housing for Man	3		SP 202 App. Oral Comm.	3	
PE Physical Education	1		PE Physical Education	1		PE Physical Education	1	
			SOPHOMORE YEAR					
EH 253 Lit. in English	3		EH 254 Lit. in English	3		EC 200 Economics I	3	
VM 210 Human Physiology	5		PS 204 Found. of Physics	5		SV 201 Intr. to Sociology	5	
PG 211 Intr. to Psychology I	3		PG 212 Intr. to Psy. II	3		CA 233 Home Equipment	5	
HY 103 World History	3		NF 202 Meal Management	5		JM 315 Agr. Journalism	3	
CA 225 Textiles	5		Elective	1				
			JUNIOR YEAR					
FCD 323 Mgt. for Modern Living	3		VM 311 Gen. Bacteriology	5		CA 343 Int. Home Problems	5	
CA 303 The House	5		CA 333 Light. Equipment	3		NF 353 Comm. & Fam. Health	3	
FCD 307 Growth & Dev. of Child.	5		CA 313 Home Furnishings	5		CA 310 Mass Commun. in Fam. and Consumer Serv.	3	
Elective	5		EC 341 Business Law	5		NF 372 Fund. of Nutrition	3	
						Elective	3	
			SENIOR YEAR					
CA 453 Cons. & the Mkt.	5		FCD 463 Family Economics	5		FCD 457 Family Relations	5	
FCD 443 Home Mgt. Residence	5		CA 433 Food Equipment	5		CA 431 Man-Environ. Rel.	5	
Electives	7		Electives	8		Electives	8	

Total — 210 quarter hours

## Department of Consumer Affairs

The Department of Consumer Affairs focuses on man's physical environment and resources, including his personal interaction with this environment. The housing in which he lives, the home furnishings and equipment surrounding him, the clothes he wears, and the beauty in his environment are all matters of fundamental concern.

Three majors are currently offered in this department: Clothing, Textiles and Related Art; Fashion Merchandising; Housing and Equipment. Students are trained to apply science and technology in evaluating consumer products. This training, in addition to providing better consumers, leads to careers for men and women in business or government positions serving consumers in fields such as fashion merchandising, textile design, textile science, and public utilities.

### Clothing, Textiles and Related Art (CT)

Clothing, Textiles, and Related Art is a professional option curriculum providing flexibility for preparation in specific areas of specialization based on students' professional goals. Diversification within the major allows for application of knowledge in such varied fields as tex-

tile and apparel design, production and promotion; research; fashion journalism; consumer problems; and individual creativity. A unique interdisciplinary potential is created by the existence on one campus — located within a textile area — of Clothing and Textiles, Textile Engineering, the Experiment Station for research and the Cooperative Extension Service for consumer application.

### Curriculum in Clothing, Textiles and Related Art (CT)

#### FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	Eng. Comp. . . . . 3	EH 102	Eng. Comp. . . . . 3	EH 103	Eng. Comp. . . . . 3
HY 101	World History . . . . 3	HY 102	World History . . . . 3	HY 103	World History . . . . 3
MH 159	Precalculus . . . . . 5	CH 103	Gen. Chem. . . . . 4	CH 104	Gen. Chem. . . . . 4
	Mathematics . . . . . 5	CH 103L	Gen. Chem. Lab. . . 1	CH 104L	Gen. Chem. Lab. . . 1
CA 116	Art for Everyday . . . 3	CA 115	Clothing & Man. . . . 3	CA 105	Fund. of Clo. . . . . 5
FCD 110	Living . . . . . 3	LY 101	Use of Library . . . . 1	PE	Physical Education . . 1
	H.E. in Contemp. . . . 1	PE	Physical Education . . 1		
PE	Physical Education . . 1				

#### SOPHOMORE YEAR

EH 253	Lit. in Eng. . . . . 3	EH 254	Lit. in Eng. . . . . 3	SY 201	Sociology . . . . . 5
PG 211	Gen. Psych. . . . . 3	NF 119	Nutr. & Man. . . . . 3	VM 210	Human Physio. . . . 5
EC 200	Economics I . . . . . 5	CA 225	Textiles . . . . . 5	SP 202	App. Oral Comm. . . 3
FCD 117	Fam. & Human . . . . 3		**Support Electives . . 5		**Support Elective . . 5
	Dev. . . . . 3	CA 113	Housing for Man . . . 3		
	***Approved . . . . . 4				
	Elective . . . . . 4				

#### JUNIOR YEAR

PS 204	Physics . . . . . 5	VM 311	Bacteriology . . . . . 5	CA 385	Creative Weaving . . 3
JM 315	Ag. Journalism . . . . 3	FCD 323	Management for . . . 3	CA 395	Clothing Design . . . 5
	**Support Elective . . 5		Living . . . . . 3		*Professional . . . . . 5
	***Home Economics . . 5	CA 303	The House . . . . . 5		Elective . . . . . 5
	Elective . . . . . 5		***Home Economics . . 5		***Approved . . . . . 5
			Elective . . . . . 5		Elective . . . . . 5

#### SENIOR YEAR

	*Professional . . . . . 10	CA 425	History of Cost . . . . 5	CA 431	Man-Environment . . 2
	***Approved . . . . . 8		*Professional . . . . . 5		*Professional . . . . . 5
	Electives . . . . . 8		***Approved . . . . . 8		Elective . . . . . 5
			Electives . . . . . 8		***Approved . . . . . 10
					Electives . . . . . 10

### Total — 210 quarter hours

\*Professional Electives — a minimum of 25 hours of Clothing and Textiles chosen with advice and consent of adviser.

\*\*Supporting Electives — a minimum of 15 hours from an area outside the School of Home Economics in a discipline that will closely support professional goals.

\*\*\*Home Economics Electives — a minimum of 10 hours chosen from some other area of Home Economics for personal or professional goals.

\*\*\*\*Approved Electives — In addition to the specified electives, a minimum of 28 hours will be taken in a special area of professional interest. Examples: Textile Science, Textile Design, Design and Production of Clothing, Education, and Fashion Journalism.

All electives must be approved by the student's adviser.

### Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or owner-manager of a small store. Three months of retail training is included in the fashion merchandising curriculum.

## Curriculum in Fashion Merchandising (FM)

## FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	History	3	HY 102	History	3	HY 103	History	3
MH 159	Math.	5	CH 103	Chemistry	4	CH 104	Chemistry	4
CA 116	Art for Everyday		CH 103L	Chemistry Lab.	1	CH 104L	Chemistry Lab.	1
	Liv.	3	CA 115	Clothing & Man	3	NF 119	Nutrition & Man.	5
FCD 110	Contemporary H.		LY 101	Library Science	1	FCD 257	Fam. & Human	
	Ec.	1	PE	Physical Education	1		Dev.	3
PE	Physical Education	1				PE	Physical Education	1

## SOPHOMORE YEAR

EH 253	English Lit.	3	EC 202	Economics II	5	ACF 211	Accounting	5
EC 200	Economics I	5	CA 225	Textiles	5	PS 204	Physics	5
CA 205	Family Clothing	3	SY 201	Sociology	5	PG 211	Psychology	5
VM 210	Physiology	5	CA 113	Housing for Man	3	SP 202	App. Oral Comm.	3

## JUNIOR YEAR

MT 331	Marketing	5	CA 325	Retailing	5	CA 335	Retail Training	8
CA 316	Fashion Analysis	5	FCD 325	Mgt. for Modern			Prof. Elective	5
JM 315	Journalism	3		Liv.	3		Elective	5
	Prof. Elective	5	VM 311	Bacteriology	5			
			CA 385	Creative Weaving	3			
				Elective	3			

## SENIOR YEAR

CA 416	Apparel Quality		MT 432	Advertising	3	MT 435	Mktg. Problems	5
	Evaluation	5	CA 425	History of Costume	5	CA 435	Textile Testing	5
CA 483	Eq. & Care of Tex.	5	CA 445	Fash. Merchandising	5	EC 438	Retail Mdsing.	5
	Elective	5	CA 431	Man-Environment			Prof. Elective	3
	Prof. Elective	5		Relations	2			

Total - 210 quarter hours

## Housing and Equipment (HEQ)

The Housing and Equipment program prepares students for positions with public utilities, manufacturers, retail dealers, research centers, governmental agencies, retail associations, and other business areas in Home Economics. This curriculum serves and prepares professional homemakers, those engaged in adult education and Cooperative Extension. Courses from this program may be elected by students in other curricula; examples include programs centered on safety education, house structure, engineering and the applications of physics.

## Curriculum in Housing and Equipment (HEQ)

## FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English		EH 102	English Composition	3	EH 103	English	
	Composition	3	CH 103	General Chemistry	4		Composition	3
CA 116	Art for Everyday		CH 103L	Chemistry Lab.	1	CH 104	General Chemistry	4
	Liv.	3	CA 115	Clothing and Man	3	CH 104L	Chemistry Lab.	1
MH 107	College Algebra	5	HY 101	World History	3	HY 102	World History	3
FCD 110	Contemp. H. E.	1	CA 113	Housing and Man	3	FCD 257	Family and Human	
NF 119	Nutrition and Man	5	PE	Physical Education	1		Dev.	3
LY 101	Use of Library	1				SP 202	App. Oral Comm.	3
PE	Physical Education	1				PE	Physical Education	1

## SOPHOMORE YEAR

EH 253	Literature in		EH 254	Literature in		EC 200	Economics I	5
	English	3		English	3	CA 235	Home Equipment	5
HY 103	World History	3	NF 202	Meal Management	5	SY 210	Intr. to Sociology	5
VM 210	Human Physiology	5	PG 212	Intr. to Psychology		JM 315	Agri. Journalism	3
PG 211	Intr. to Psychology I	3		II	3			
CA 225	Textiles	5	PS 204	Foundations of				
				Physics	5			



**JUNIOR YEAR****Second Quarter**

First Quarter	
CA 303 The House	5
FCD 323 Mgt. for Modern Living	3
CA 343 Int. Home Problems	5
Approved Elective	5

CA 333 Lighting Equipment	3
VM 311 General Bacteriology	5
CA 310 Mass Commun. in Family and Cons. Services	3
CA 423 Eq. and Housing Tech.	5

**Third Quarter**

NF 353 Com. and Family Health	3
CA 433 Food Equipment	5
Approved Electives	10

**SENIOR YEAR**

CA 455 The Cons. and the Mkt.	5
Approved Electives	13

CA 493 House Utility Core	3
FCD 465 Family Economics	5
Approved Electives	10

CA 483 Laundry Eq. and Care of Textile Articles	5
FCD 443 Home Management Residence	5
CA 431 Man-Environ. Rel. or Senior Seminar	2-3
Approved Electives	4

Total — 210 quarter hours

## Department of Nutrition and Foods

The Department of Nutrition and Foods is primarily concerned with the healthy physical growth and development of individuals and families.

Through its majors in Nutrition and Foods, Institution Food Management, and Pre-Nursing Science, this department prepares students for positions in hospitals, business and industry, and teaching and assists in solving national and international health problems.

### Institution Food Management (IFM)

The Institution Food Management major trains both men and women to manage efficiently commercial, industrial, and institution food service operations. Food Production, consumption and service is today the third largest business in the world and demands highly trained personnel.

### Curriculum in Institution Food Management (IFM)

**FRESHMAN YEAR****Second Quarter**

First Quarter	
EH 101 Eng. Comp.	3
NF 119 Nutr. and Man.	3
HY 101 World History	3
LY 101 Library Science	1
MH 159 or 160 Math.	5
MS Military Training—men or elect.—women	1
PE Physical Education	1

CH 103 Gen. Chem.	4
CH 103L Chem. Lab.	1
EH 102 Eng. Comp.	3
NF 102 Foods & Nutr.	5
HY 102 World History	3
MS Military Training—men or elect.—women	1
PE Physical Education	1

**Third Quarter**

CH 104 Gen. Chem.	4
CH 104L Chem. Lab.	1
EH 103 Eng. Comp.	3
HY 103 World History	3
MS Military Training—men or elect.—women	1
PE Physical Education	1
NF 202 Meal Mgt.	5

**SOPHOMORE YEAR**

CH 203 Organic Chem.	5
EC 211 Accounting	5
EH 253 Lit. in Eng.	5
MS Military Training—men or elect.—women	1
PG 211 Gen. Psychology	3

EC 200 Economics I	5
SY 201 Sociology	5
MS Military Training—men or elect.—women	1
PS 204 Physics	5

EC 202 Economics II	5
SP 202 App. Oral Comm.	3
MS Military Training—men or elect.—women	1
VM 210 Physiology	5
Elective	3

**JUNIOR YEAR**

EC 341 Business Law	5
NF 412 Quantity Food Production	5
IM 315 Ag. Jo.	3
*Elective	5

NF 352 Inst. Org. & Per. Mgt.	5
NF 372 Nutr. & Health	3
VM 311 Bacteriology	5
Elective	5

MT 331 Prin. of Mkt.	5
EC 333 Salesmanship	3
NF 362 Problems in Comm. Nutrition	3
*Elective	5

\*To qualify for ADA membership through therapeutic and administrative dietetics, students will be required to take HE 312, Nutritional Biochemistry; HE 372, 452, Nutrition and Diet. HE 402 Diet Therapy, FED 214, Educational Psychology.

## SENIOR YEAR

MT 432 Advertising .....	3	NF 432 Food Serv. Plan. ....	5	AH 310 Meat & Meat	
IE 301 Elec. Data Proc. ....	5	Lay-out Equip. ....	5	Prod. ....	3
Electives .....	8	DH 411 Food Plant San. ....	5	NF 422 Inst. Food Purch. ....	5
		NF 442 Catering .....	3	NF 482 Food Serv. Cost	
		NF 462 Exp. Foods .....	5	Control .....	5
				Elective .....	3

Total — 209 quarter hours

*Nutrition and Foods (NF)*

Nutrition and Foods prepares majors for positions in research, teaching, extension, communications (journalism, radio, television), food service, dietetics (therapeutic, clinical, consulting, administrative). Such positions are available in private industry, hospitals, government agencies and educational institutions.

## Curriculum in Nutrition and Foods (NF)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
EH 101 English Comp. ....	3		EH 102 English Comp. ....	3		EH 103 English Comp. ....	3	
HY 101 World History ....	3		HY 102 World History ....	3		HY 103 World History ....	3	
MH 150 or 160 Math .....	5		CH 103 Gen. Chemistry .....	4		CH 104 Gen. Chemistry .....	4	
NF 119 Nutrition and Man ..	3		CH 103L Gen. Chemistry			CH 104L Gen. Chemistry		
FCD 110 Contemporary			Lab. ....	1		Lab. ....	1	
H. Ec. ....	1		CA 115 Clothing and Man. ....	3		NF 102 Foods and		
PE Physical Education .....	1		LY 101 Use of Library .....	1		Nutrition .....	5	
			PE Physical Education .....	1		PE Physical Education .....	1	

## SOPHOMORE YEAR

CH 203 Organic Chemistry ..	5	EC 200 Economics I .....	5	PG 211 Gen. Psychology .....	5
NF 202 Meal Management .....	5	ACF 211 Accounting .....	5	NF 312 Nutr. Bio. Chemistry ..	5
SY 201 Sociology .....	5	EH 253 Lit. in English .....	5	VM 210 Physiology .....	5
CA 113 Housing for Man .....	3	CA 116 Art for Everyday		SP 202 App. Oral. Comm. ....	5
		Liv. ....	3		

## JUNIOR YEAR

FED 214 Ed. Psychology .....	5	NF 352 Inst. Org. & Mgt. ....	5	PS 204 Physics .....	5
FCD 323 Mgt. for Modern		VM 311 Bacteriology .....	5	JM 315 Ag. Journalism .....	3
Liv. ....	3	Prof. Electives .....	8	Prof. Electives .....	10
NF 372 Fund. of Nutrition ..	3				
FCD 257 Fam. & Human					
Dev. ....	3				
Elective .....	4				

## SENIOR YEAR

NF 412 Qty. Food		NF 342 Nutr. & Diet .....	5	NF 402 Diet Therapy .....	5
Production .....	5	NF 462 Exp. Foods .....	5	NF 422 Inst. Food	
Prof. Electives .....	13	Electives .....	8	Purchasing .....	5
				CA 431 Man-Environment	
				Relations .....	2
				Elective .....	4

Total — 209 quarter hours

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research, and Teacher Education may be developed through choice of elective courses.

*Pre-Nursing Science (NS)*

Pre-Nursing Science provides Nursing Science majors with a basic two-year program. Upon satisfactory completion, students will be assisted with transfer to an accredited School of Nursing for completion of the baccalaureate program in nursing. The Emory University, the University of Alabama, and other accredited schools of nursing have approved this program as meeting their pre-nursing requirements.

## Curriculum in Pre-Nursing Science (NS)

## FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101 Eng. Comp.	3	BI 101 Biology	4	CH 104 Gen. Chem.	4
NF 102 Foods & Nutr.	5	BI 101L Biology Lab.	1	CH 104L Chem. Lab.	1
HY 101 World History	3	CH 103 Gen. Chem.	4	HY 103 World History	3
LY 101 Library Science	1	CH 103L Chem. Lab.	1	EH 103 Eng. Comp.	3
MH 159 or 160 Math	5	EH 102 Eng. Comp.	3	PE Physical Education	1
PE Physical Education	1	HY 102 World History	3	*BI 104 Human Biology or	
		PE Physical Education	1	**VM 220 Human Anat. & Physiology	5

## SOPHOMORE YEAR

CH 203 Organic Chem.	5	FCD 207 Prin. of Child Development	3	FED 214 Educ. Psychology	5
PG 211 Gen. Psych.	3	NF 372 Nutr. & Health	3	NF 312 Biochemistry	5
SY 201 Sociology	5	PG 212 Gen. Psych.	3	NF 362 Problems in Comm. Nutrition	3
*VM 210 Physiology or		*PA 330 Philosophy of Rel. or		EH 253 Lit. in Eng.	3
**VM 221 Human Anat. & Physiology	5	VM 311 Bacteriology	5	SP 202 App. Oral Comm. or Elective	3
		**PS 204 Physics	5		

Total — 108 quarter hours

\*Courses required by Emory University.

\*\*Courses required by the University of Alabama.

## Dual Objective Program with the School of Education

**Teacher Education:** Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Home Economics to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and curriculum requirements in the School of Home Economics in any one of five areas, the Dean of the School of Education will recommend to the State Department of Education that the appropriate professional certificate be issued. The five majors within the dual objective program are as follows:

Family Life and Early Childhood Education  
Clothing, Textiles and Related Art  
Nutrition and Foods  
Home Management and Family Economics  
Housing and Equipment

It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the School of Home Economics. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both the Home Economics curricula and Teacher Education training.

## GRADUATE WORK

The School of Home Economics offers work leading to the Master of Science degree, Master of Arts degree, and to the professional degree, Master of Home Economics. For further information consult the Home Economics course descriptions and the graduate catalog.

# School of Pharmacy

SAMUEL TERRY COKER, *Dean*

**T**HE SCHOOL OF PHARMACY is a member in good standing of the American Association of Colleges of Pharmacy, which promotes pharmaceutical education. It is also fully accredited by the American Council on Pharmaceutical Education, which formulates the educational, scientific and professional principles and standards which approved Schools of Pharmacy are expected to meet and maintain.

## *Careers in Pharmacy*

The thorough academic background provided by the five-year curriculum prepares students to pursue a variety of careers. Excellent opportunities exist in community pharmacy, wholesale pharmacy, industrial pharmacy (research, product development, analytical control and product manufacture, sales and distribution), hospital pharmacy, public health, Food & Drug Administration, toxicology, and research and teaching after further education. Pharmacy, especially hospital pharmacy, offers outstanding opportunities for women. Many opportunities exist in each of these areas for the pharmacist of the future.

## Curriculum in Pharmacy (PY)

### *Admission Requirements*

The curriculum in pharmacy prepares students for licensure by the pharmacy boards of the various states as well as for careers in those areas of pharmacy not requiring registration.

The entrance requirements of the School of Pharmacy may be satisfied by completion of the basic six quarter pre-pharmacy curriculum as outlined on page 101. Any or all of these requirements may be met by transfer. A minimum grade point average of 1.00 is required for successful completion of the pre-pharmacy curriculum.

The student must make application to the Pharmacy Admissions Committee for determination of eligibility. Special application forms are available from the School of Pharmacy and the University Office of Admissions. A transfer student must submit an application to the Pharmacy Admissions Committee at least 30 days prior to the expected date of admission. This application is in addition to the one required for admission to Auburn University. Students on the Auburn campus should follow the schedule suggested by the pre-pharmacy advisor. Transfer students from Junior Colleges may receive no more than 109 quarter hours credit (equal to two years of pre-pharmacy) whereas students transferring from four-year institutions will receive no more than 127 quarter hours credit for work completed in a non-pharmacy curriculum.

A candidate for the Bachelor of Science in Pharmacy degree must complete 20 hours in the areas of Humanities and Social Sciences (Group I) with a minimum of 12 hours in courses of at least sophomore level in one and a minimum of 8 hours in courses of at least sophomore level in the other of these two general areas. Some of the courses included in these two areas are required for the Bachelor of Science degree in Pharmacy and may be scheduled any time prior to the third professional year. It is recommended that these required courses be scheduled early in order to avoid possible scheduling difficulties.

In addition to the 20 hours required in the areas of Humanities and Social Sciences, a student may complete his remaining elective requirement in these two areas or in the areas of Mathematics and Natural Science (Group II).

### ***Curriculum Options***

After admission to the School of Pharmacy students may choose either a professional option in preparation for general practice, including hospital pharmacy, or a scientific option in preparation for industry, research or teaching. The program of each student under either option must be approved by the advisor and those choosing the scientific option must have the approval of the Dean. Both options will adequately prepare students for State Board examinations. It is hoped that these options will motivate the superior student to achieve an educational level consistent with his ability and interests.

Electives should be chosen according to the interests of the student and approved by the adviser.

Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year. Such work cannot be applied toward both the undergraduate and graduate degrees. Registration in graduate courses must be approved by the Dean of Graduate School.

Attention is called to the following regulation of the American Council on Pharmaceutical Education: "No student may graduate from a recognized college or school of pharmacy who has spent less than three scholastic years of nine quarters or six semesters in residence at said school or college."

### ***Scholarships and Loans***

Information concerning available scholarships and loans may be obtained by contacting the Director of Student Financial Aid, or the Dean, School of Pharmacy, Auburn University.

### ***Pharmacy Extension Program***

A program of extension and continuing education is available for Alabama pharmacists. The rapid advancements being made in the pharmaceutical sciences make it imperative to bring new knowledge and refresher courses to the pharmacist in or near his home. Meetings will be held throughout the year, enabling most Alabama pharmacists to avail themselves of the educational service. Faculty members of the

School, as well as experts in industry and in state and federal governmental agencies, will serve as instructors.

### Curriculum in Pharmacy (PY)

#### FIRST PROFESSIONAL YEAR\*

First Quarter	Second Quarter	Third Quarter
PY 100 Convocation** — 0	PY 100 Convocation — 0	PY 100 Convocation — 0
PY 201 Inorganic Phar. — 5	PY 203 Organic Phar. — 5	PY 102 Phar. Mathematics — 3
Chem. — 5	Chem. I — 5	PY 306 Pharmacognosy I — 5
PY 205 History of Pharmacy — 3	VM 200 Microbiology — 5	PY 302 Organic Phar. — 5
CH 301 Biochemistry — 5	CH 302 Biochemistry — 4	Chem. II — 5
EC 200 General Economics — 5	EC 211 Intr. Accounting — 5	VM 204 Pathogenic Microbio. — 5

#### SECOND PROFESSIONAL YEAR

PY 100 Convocation — 0	PY 100 Convocation — 0	PY 100 Convocation — 0
PY 301 Phar. Tech. I — 5	PY 303 Phar. Tech. II — 5	PY 304 Phar. Tech. III — 5
PY 407 Chemotherapy — 5	PY 405 Pharmacology I — 5	PY 406 Pharmacology II — 5
ZY 424 Animal Physiology — 5	***PY 307 Pharmacognosy — 5	PY 404 Chemistry of Natural Products — 5
	II — 5	
	Elective — 3	

#### THIRD PROFESSIONAL YEAR

PY 100 Convocation — 0	PY 100 Convocation — 0	PY 100 Convocation — 0
PY 400 Disp. Pharmacy I — 5	PY 401 Disp. Pharmacy II — 5	PY 402 Disp. Pharmacy III or — 5
***PY 416 Drug Marketing — 3	PY 415 Phar. Jurisprudence — 3	PY 411 Elements of Phar. Mfg. — 5
Elective — 5	***PY 408 Pharmacy — 5	PY 428 Public Health — 5
Professional Elective — 3	Mgt. I — 3	***PY 409 Pharmacy — 5
	Professional Elective — 5	Mgt. II — 5
		Elective (Group II) — 5

Total — 153 quarter hours

\*Options may be chosen at the beginning of the First Professional Year.

\*\*Required of all Pharmacy students each quarter.

\*\*\*With consent of the advisor and approval of the Dean, those electing the scientific option may substitute courses of equal credit for these subjects.

NOTES: 1. Proficiency in typing is required for admission to the fifth year.

2. Students are expected to participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.

3. A set of Class C Metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.

Group I Electives: Courses in Departments of English, Foreign Language\*, Speech, Philosophy, Music, Drama and Art, Psychology, Sociology, Economics, Business Administration, Geography, History, and Political Science.

Group II Electives: Courses in Departments of Mathematics, Chemistry, Physics, Animal Science, Poultry Science, Veterinary Medicine, Botany, Zoology, and Pharmacy.

\*Ten hours must be completed in one language for credit.

#### RECOMMENDED ELECTIVES

SP 202, PG 211, PG 212, EH 214, EH 253, EH 254, any Foreign Language (2 quarters of one language required for credit), PA 210, PA 211, PA 212, HY 201, HY 202, EC 201, EC 212, EC 341, MH 162, MH 163, MH 264, MH 367, IE 204, BY 401, ZY 300, ZY 301, ZY 302, PY 101, PY 202. Any course in Groups I or II of 300 level or higher may be considered as a suitable elective.



# School of Veterinary Medicine

J. E. GREENE, *Dean*  
NELSON KING, *Assistant Dean*

**T**HE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of at least seven quarters of the pre-professional course.

## *Specific Information*

### **Admission**

Seven quarters of general college work, with a minimum honor point average of 1.25 on all courses attempted and on all required courses is required for admission. A grade of D on any required course will not be accepted. The Committee on Admissions of the School of Veterinary Medicine may require a personal interview with any applicant and may also require a reading comprehension test, or an examination on any required course. The School of Arts and Sciences offers a two-year Pre-Veterinary Medicine Curriculum which is available to residents of Alabama. Although farm experience is not a requirement for admission, applicants are urged to gain such experience. Students without farm knowledge frequently have difficulty with certain courses, particularly in the clinical areas. Applications for admission to the pre-veterinary course should be made directly to the Admissions Officer, Auburn University.

Residents of states other than Alabama should complete the pre-professional requirements at institutions within their home state, since they are not eligible for admission to the pre-professional curriculum at Auburn University. One hundred and twenty quarter hours pre-professional work is required for entrance into the professional curriculum. This 120 quarter hours must include 15 quarter hours of inorganic chemistry, 10 quarter hours of organic chemistry, 10 quarter hours of physics, 5 quarter hours of genetics, 10 quarter hours of zoology, 9 quarter hours of English, 10 quarter hours of college mathematics including calculus, 5 quarter hours of animal nutrition, 3 quarter hours of feeds and feeding, 9 quarter hours of history, and 3 quarter hours of medical vocabulary. An additional 15 quarter hours of electives in humanities and fine arts, and the social sciences must be earned to meet the Liberal Educational requirements of the University. Ten quarter hours of Latin or modern language may be substituted for medical vocabulary, or this course may be taken through the Correspondence Study

Department, Auburn University. Three semester-hour courses will be accepted as the equivalent in subject-matter content of five-quarter-hour courses.

Admission to the School of Veterinary Medicine must be gained through formal application not later than February 15 preceding the Fall Quarter in which admission is desired. Preliminary consideration for admission will be based on academic work completed prior to February 15. Final consideration will be based on academic work completed prior to June 15.

### *Applicants Should Submit the Following*

1. Two completed applications for admission on form supplied by Auburn University. All applications must be submitted to the Dean, School of Veterinary Medicine, through proper channels by February 15 preceding admission date. (Only one transcript is required of students formerly enrolled at Auburn University.)
2. Two official transcripts from each college or university attended.
3. A list of courses in progress at time of application, if any.
4. Letters of recommendation from three persons vouching for character, integrity and general qualifications.

Those applicants who have not completed all requirements for admission at the time of application must submit by July 1 two supplemental official transcripts of any work completed after application is filed.

If a student is admitted to the School of Veterinary Medicine, he must submit in addition to the above, one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University), and an application processing fee.

The final selection of students is made by the Committee on Admissions of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant. All applications for admission must be on file at the School of Veterinary Medicine by February 15 preceding date of admission.

**Microscopes.** — In order to be admitted to the School of Veterinary Medicine, students must own a compound microscope acceptable to the faculty. Students must furnish a microscope in all courses requiring the use of this instrument. Microscopes may be purchased through the Book Store of Auburn University.

**Admission under the Regional Plan.** — Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine serves six states — Alabama, Florida, Kentucky, Louisiana, Mississippi and Tennessee. While there is no limit on the number of applications, the School's facilities make it necessary to restrict admissions.

The Land-Grant Institution in each state participating under the Southern Regional Education plan maintains a counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other than Land-Grant Institutions of the several states should contact the counseling and guidance service for information and advice concerning courses which will be acceptable in the pre-veterinary curriculum. Inquiries should be made early and addressed to:

Alabama:	Dean, School of Arts and Sciences Auburn University Auburn, Alabama
Florida:	Dean, College of Agriculture University of Florida Gainesville, Florida
Kentucky:	Executive Secretary Council on Public Higher Education State National Bank Building Annex Frankfort, Kentucky
Louisiana:	Head, Department of Veterinary Science Louisiana State University Baton Rouge, Louisiana
Mississippi:	Dean, School of Agriculture Mississippi State University State College, Mississippi
Tennessee:	Dean of Resident Instruction College of Agriculture University of Tennessee Knoxville, Tennessee

The procedure for making application for admission to the School of Veterinary Medicine under the Regional Plan varies in the several states. An officer, or board, in each state certifies applicants as to residence and evaluates the courses completed. Courses acceptable in the degree program at the State Land-Grant Institution will be considered acceptable in the Auburn University pre-veterinary program. An applicant who wishes to be included in his state's list of eligibles for entrance into the School of Veterinary Medicine should send his completed application together with three letters of recommendation and transcripts covering all college work completed to the appropriate address as indicated below:

Alabama:	Dean, School of Veterinary Medicine Auburn University Auburn, Alabama
Florida:	Certification Committee for Regional Education State University System of Florida Office of the Board of Regents Tallahassee, Florida 32304

Kentucky:	Chairman Committee on Regional Veterinary Training University of Kentucky Lexington, Kentucky
Louisiana:	Chairman, Certification Committee Louisiana State University Baton Rouge, Louisiana
Mississippi:	Executive Secretary Board of Trustees for Institutions of Higher Learning State Capitol Jackson, Mississippi
Tennessee:	Committee on Regional Veterinary Training University of Tennessee Knoxville, Tennessee

## Scholastic Requirements

Students enrolled in the School of Veterinary Medicine who make a scholastic average less than 1.25 for any two quarters of one academic or calendar year may be dropped from the School of Veterinary Medicine for scholastic deficiency. Students who make a grade of F on any course may be required to withdraw from the School of Veterinary Medicine. If readmitted such students may be required to repeat certain other courses in the curriculum for that quarter.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the University scholastic requirements for continuation in residence. The scholastic penalties incurred while enrolled in the School of Veterinary Medicine will become a part of the student's record.

## Curriculum in Veterinary Medicine (VM)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
VM 320 Anatomy I ..... 5	VM 321 Anatomy II ..... 5	VM 322 Anatomy III ..... 5
VM 326 Histology ..... 5	VM 327 Organology ..... 5	VM 328 Embryology ..... 5
VM 330 Vet. Micro. I ..... 5	VM 331 Vet. Micro. II ..... 5	VM 336 Physiology IV ..... 5
VM 318 Physiology I ..... 3	VM 329 Physiology II ..... 3	VM 332 Physiology III ..... 3
SECOND YEAR		
VM 436 Pharmacology I ..... 5	VM 444 Physiology VI ..... 5	VM 438 Pharmacology III ..... 5
VM 443 Physiology V ..... 5	VM 451 Pathology II ..... 5	VM 461 Vet. Micro. III ..... 5
VM 450 Pathology I ..... 5	VM 457 Vet. Parasit. II ..... 5	VM 452 Clinical Pathology ..... 3
VM 456 Vet. Parasit. I ..... 3	VM 437 Pharmacology II ..... 3	VM 453 Pathology III ..... 3
		VM 458 Vet. Parasit. III ..... 3
THIRD YEAR		
PH 422 Avian Disease ..... 5	VM 501 Vet. Medicine II ..... 5	VM 504 Vet. Surgery II ..... 5
VM 500 Vet. Medicine I ..... 5	VM 523 Veterinary Public Health I ..... 5	VM 512 Vet. Surgery III ..... 5
VM 510 Vet. Medicine IV ..... 5	VM 503 Vet. Surgery I ..... 3	VM 502 Vet. Medicine III ..... 3
VM 534 Lab. Animal Medicine ..... 3	VM 530 Vet. Radiology ..... 3	VM 519 Vet. Medicine V ..... 3
VM 526 Clinics I ..... 2	VM 527 Clinics II ..... 2	VM 550 Vet. Obstetrics II ..... 2
VM 525 Jurisp. & Ethics ..... 1	VM 540 Vet. Obstetrics I ..... 2	VM 508 Clinics III ..... 1
	VM 531 Jurisp. & Ethics ..... 1	VM 509 Clinics IV ..... 1

**FOURTH YEAR**

First Quarter		Second Quarter		Third Quarter	
VM 554	Vet. Medicine VI .....5	VM 555	Vet. Medicine VII .....5	VM 556	Vet. Medicine VIII .....5
VM 569	Veterinary Public .....5	VM 559	Vet. Medicine IX .....3	VM 588	Vet. Medicine XI .....5
	Health II .....5	VM 561	Vet. Medicine X .....3	VM 568	Clinics IX .....3
VM 542	Applied Anatomy .....3	VM 567	Clinics VII .....3	VM 582	Seminar .....3
VM 560	Vet. Obstetrics III .....3	VM 564	Clinics VIII .....2	VM 565	Clinics X .....2
VM 566	Clinics V .....3	VM 552	Jurisp. & Ethics .....1	VM 574	Vet. Surgery VI .....1
VM 563	Clinics VI .....2	VM 573	Vet. Surgery V .....1		
VM 572	Vet. Surgery IV .....1				

**Total — 230 quarter hours**

**Graduate**

All departments offer programs through the Graduate School leading to a Master of Science degree. Master's degree candidates may be required to pass a preliminary oral and/or written examination to demonstrate adequate knowledge in their chosen fields. A doctoral program leading to a Doctor of Philosophy is offered in Physiology. This is an interdisciplinary program that offers sufficient flexibility to permit students to adapt programs to their individual needs.

**Extension**

Under the direction of the Vice President for Extension this school provides continuing education programs throughout the year in Auburn and at off-campus sites.

# The Graduate School

W. V. PARKER, *Dean*  
PAUL F. PARKS, *Assistant Dean*

**A**LL REGULATIONS governing the Graduate School are designed to equal or exceed the minimum standards recommended by the Commission on Colleges and Universities of the Southern Association of Colleges and Secondary Schools.

A student with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration. Two transcripts of undergraduate credits and satisfactory scores on the Aptitude Test of the Graduate Record Examinations must also be submitted. Every applicant must have a satisfactory undergraduate record and show adequate preparation in the field in which he desires to major as determined by the screening committee of the department concerned.

The Graduate School bulletin should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult this bulletin for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

The Graduate School administers graduate work leading to the degrees listed below.

## Graduate Degrees

### *The Master's Program*

**Master of Science** in the areas of Aerospace Engineering, Agricultural Economics and Rural Sociology, Agricultural Engineering, Agronomy and Soils, Animal Science, Animal Nutrition, Botany and Plant Pathology, Business Administration, Chemical Engineering, Chemistry, Civil Engineering, Dairy Manufacturing, Dairy Production, Economics, Education, Electrical Engineering, Entomology, Fisheries Management, Forestry, Home Economics, Horticulture, Industrial Engineering, Mathematics, Mechanical Engineering, Nuclear Science, Ornamental Horticulture, Pharmacy, Physics, Poultry Science, Psychology, Toxicology, Veterinary Medicine, Wildlife Management, and Zoology.

**Master of Arts** in the areas of English, History, and Speech.

**Other Master's Degrees:** Master of Agriculture, Master of City and Regional Planning, Master of Fine Arts, Master of Building Construction, Master of Business Administration, Master of Education, Master of Home Economics, Master of Arts in College Teaching.



### ***The Specialist in Education Program***

**Specialist in Education** in the areas of Curriculum, Teaching, Administration, Supervision, and Guidance.

### ***The Doctoral Degree Program***

**Doctor of Education** in the areas of School Administration, Supervision and Guidance; and Curriculum and Teaching.

**Doctor of Philosophy** in the Departments of Agronomy and Soils, Animal Science, Botany and Plant Pathology, Chemistry, Electrical Engineering, English, Forestry, History, Mathematics, Mechanical Engineering, Physics, Poultry Science, Psychology, and Zoology-Entomology, and interdisciplinary programs in Agricultural Engineering, and Physiology.

### **Research Program with the Oak Ridge Associated Universities**

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association our graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories. When advanced degree candidates in certain areas have completed their residence work at Auburn it is possible, by special arrangement, for them to go to Oak Ridge to do their research problems and prepare their theses. In addition, it is possible for our faculty members to obtain appointments on the Oak Ridge Research Participation Program for varying periods, usually not less than three months, in order to pursue advanced studies in their fields of specialization. Thus, both faculty and students may keep abreast of the most modern and up-to-date developments in atomic and nuclear research that is in progress at the Oak Ridge Laboratories.

The students will go to Oak Ridge on Oak Ridge Graduate Fellowships. The stipend will be determined by the number of dependents of the student and by the level of work which he is prepared to do. Faculty members may work in Oak Ridge on stipends commensurate with their current college salary and rank.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

### **Auburn Computer Center**

LELAND H. WILLIAMS, *Director*

The Auburn Computer Center, which is equipped with an IBM 360 model 50 computer, is administered by the Graduate School. Computer time is available for research, instructional, extension, or administrative

projects with the endorsement of any University department. However, all researchers are encouraged to obtain external funds to support computer time and associated costs required for their work. Details concerning arrangements for the use of computer services are available in most departments but can also be obtained from the Director of the Computer Center.

# Reserve Officers Training Corps

## *Department of Military Science*

COLONEL ANDREW W. LAMAR, JR.  
*Commandant and Professor of Military Science*

**S**TUDY OF MILITARY SCIENCE at Auburn University dates back to the Civil War period. The Morrill Land Grant Act of 1862 requires that military instruction be furnished to students. Instruction in Military Science is under the supervision of an officer of the Active Army who is detailed as Professor of Military Science. By appointment of the college authorities he is Commandant of the ROTC students. The Professor of Military Science is assisted by a staff of commissioned and non-commissioned officers of the Army. The curriculum in Military Science is divided into two courses, basic and advanced. A description of course requirements is discussed in the following paragraphs.

### **Basic Course**

The basic course consists of a six-quarter block of instruction normally taken during the freshman and sophomore years. During the freshman year, three hours of instruction (one classroom and two drill) are taken each week for three quarters.

In the sophomore year four hours of instruction (two classroom and two drill) are taken each week in three quarters. All freshman and sophomore military science classes are offered Fall, Winter and Spring quarters, with one credit hour being allowed each quarter.

### **Basic Camp**

The basic camp consists of six weeks of field training conducted at an Army Post during the summer. Basic camp is not required for students completing the basic course described above. It is designed for transfer students who wish to substitute the successful completion of the basic camp for the six-quarters resident basic course and enroll in the advanced course. Transfer students may apply to the Professor of Military Science for deferment from their remaining basic ROTC requirement and enter into an agreement to complete basic camp and the advanced course. While attending basic camp students are paid at the rate of \$102.30 per month. Reimbursement to the student for travel expenses is made at a rate of six cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period.

## Advanced Course

The Advanced Course is designed to produce officers for the Army of the United States, both the Active Army and the Reserve. Admission to the Advanced Course is on a best qualified basis. Because the number of applications received usually exceeds the quota allotted to this unit, possession of minimum qualifications does not insure selection. Successful completion of the Advanced Course at Auburn University qualifies the student for a commission as 2nd Lieutenant in one of the following branches of the USAR: Adjutant General's Corps, Armor, Military Intelligence, Field Artillery, Air Defense Artillery, Chemical Corps, Corps of Engineers, Finance Corps, Infantry, Medical Service Corps, Military Police Corps, Ordnance Corps, Quartermaster Corps, Signal Corps, and Transportation Corps, based on student's choice and needs of the Army. Students who are designated Distinguished Military Students may apply for a Regular Army commission, if accomplished prior to graduation and designation as a Distinguished Military Graduate. The advanced course consists of a six-quarter course, normally taken during the junior and senior years, designed to qualify the student for appointment in any of the aforementioned branches. One credit hour is allowed for each quarter of the advanced course. Students are paid subsistence pay of \$50.00 per month, not to exceed 20 months, while enrolled in the Advanced Course.

An advanced camp of six weeks duration must be attended by the student before he becomes eligible for a commission. Advanced camp is normally attended during the summer between the end of the junior and the start of the senior years. While attending advanced camp students are paid \$171.60 per month. Reimbursement to the students for travel expenses is made at a rate of six cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period. The applicant for the advanced course must:

1. Be a citizen of the United States.
2. Be physically qualified in accordance with standards prescribed by the Department of the Army.
3. Not have reached 28 years of age at time of appointment in the U.S. Army Reserve.
4. Have completed appropriate basic training (2 years basic course or basic camp) or have equivalent military or ROTC training in lieu thereof; have at least two (2) academic years to complete prior to graduation.
5. Have minimum overall academic average of 1.0.
6. Be selected by the Professor of Military Science and the President of Auburn University.
7. Enlist as a cadet in the U.S. Army Reserve.
8. Execute a written agreement with the Government to complete the two-year Advanced Course training and attend one Summer Camp (six weeks duration) preferably at the end of the first year of the Advanced Course. Agree in writing to accept an appointment as a com-

missioned officer in the Army Reserve and serve the prescribed period of duty.

## **Financial Assistance Program**

The Army ROTC offers a scholarship program designed to provide financial assistance to outstanding young men in the program who are interested in the Army as a career. Each scholarship provides for free tuition, textbooks and laboratory fees in addition to pay of \$50 per month for the period that the scholarship is in effect. During a six-week summer training period, normally at the end of the junior year, this pay is increased to one-half of a second lieutenant's base pay. The scholarships are provided under provisions of Public Law 88-647, The ROTC Vitalization Act of 1964.

Scholarships may be awarded for either two or four years. Four-year scholarships are open to all students entering Army ROTC as freshmen, while the two-year scholarships are restricted to those students who have completed the first two years of ROTC and are selected by the Professor of Military Science for enrollment in the ROTC Advanced Course. To receive a four-year scholarship, students must apply while in high school.

Recipients of Army ROTC scholarships are required to serve six years in the Army, at least four years of which must be on active duty unless released earlier by the Secretary of the Army. Any of the six year period remaining after release from active duty must be spent in a reserve status.

## **Army ROTC Aviation Program**

Qualified second year advanced (MS IV) cadets may apply for enrollment in the Army ROTC Flight Training Program, subject to quota limitations. This program is conducted at no expense to the student. Participation in the program will not act to cause any reduction in the prescribed MS IV course. This course is an approved Federal Aviation Agency standardized flight instruction program consisting of 35 hours ground instruction and 36½ hours flight training. Satisfactory completion of the program of instruction will qualify the graduates for award of a FAA Private Pilot's certificate. Students must agree to a period of active duty for three years after completion of additional flight training in the active service.

## **Uniforms and Equipment**

All students are required to deposit \$30.00 with the Bursar of the University prior to enrollment in the ROTC. They are furnished a uniform in good condition and other necessary supplies through the ROTC Supply Office. Upon completion of the course of instruction, or upon withdrawal, the uniform and other supplies are turned in and the deposit less \$1.50 per quarter is returned to the student.

Advanced ROTC students are furnished uniforms under the commutation system. Upon graduation, the uniform becomes the property of the advanced student.

## **Distinguished Military Students**

The Professor of Military Science may designate as a Distinguished Military Student a person who:

1. Possesses outstanding qualities of leadership, high moral character, and definite aptitude for the military service.

2. Has attained an academic standing in the upper half of his class. An exception may be made only in the case of an individual student whose standing is in the upper 10 per cent of his class in military subjects, or who has shown exceptionally high motivation toward a military career.

3. Has demonstrated his leadership ability through his achievements while participating in recognized campus activities.

4. Has attained a class standing in the upper third of his ROTC class in the Advanced Course, Senior Division, ROTC.

Distinguished Military Students may make application for a commission in the Regular Army any time subsequent to such designation, but not later than the date on which they are designated Distinguished Military Graduates. If accepted they will be commissioned in the Regular Army upon graduation.

## **Distinguished Military Graduates**

The Professor of Military Science may designate as a Distinguished Military Graduate a person who was designated a Distinguished Military Student and who has maintained the high academic standards between the time of such designation and date of commission and graduation.

## **Selective Service Deferments**

Students enrolled in the advanced course, Army ROTC, will be deferred under the provisions of the Universal Military Training and Service Act, as amended, according to the following:

1. The students are required to sign an ROTC deferment agreement. The provisions of the agreement require the students to complete the advanced course and to accept commissions if tendered by the Department of the Army.

2. The Professor of Military Science will notify the local selective service boards of all enrolled students of their selection for deferment. Deferment by the local selective service board is mandatory unless the student has received an order to report for induction.

Students enrolled in the basic course, Army ROTC, may request the Professor of Military Science to select them for deferment. The students are required to sign an ROTC deferment agreement. The provisions of the agreement require the students to complete the basic and advanced courses and accept commissions if tendered by the Department of the Army.

Deferred students dropped from ROTC, not in good scholastic standing, or not considered potential commissioned officers, will no



longer be deferred. Students who decline to fulfill the terms of their ROTC deferment agreements pertaining to undergraduate work at the institution will be reported to Selective Service.

## Department of Naval Science

CAPTAIN J. B. SWEENEY, JR., USN  
*Commanding Officer and Professor of Naval Science*

**T**HE NAVAL RESERVE OFFICERS Training Corps is established under authority of Title 10, U. S. Code, as amended.

A Captain in the Navy or a Colonel in the Marine Corps is assigned as the Professor of Naval Science. He is assisted by commissioned officers and others detailed from the Navy and Marine Corps.

The purpose of NROTC is to provide a steady supply of well-educated junior officers for the line and staff corps of the regular Navy and to build up a reserve of trained officers who will be ready to serve their country at a moment's notice in a national emergency. NROTC graduates are given equal rank, equal treatment, and equal opportunities with the graduates of the United States Naval Academy.

### Types of NROTC Students

Students in the NROTC are of four types:

1. Regular NROTC students are appointed Midshipman, USNR. Such students assume an obligation to make all required summer practice cruises and upon acceptance of an appointment as a commissioned officer in the U. S. Navy or U. S. Marine Corps serve at the pleasure of the President. The Secretary of the Navy establishes criteria for voluntary termination of an officer's status to meet the needs of the naval service. At the present time the required minimum active duty service period of four years has been established by the Secretary of the Navy.

The Regular program briefly described above is one of the most remarkable educational opportunities ever offered. Public Law 729 (as amended by Public Law 88-647), signed by the President on 13 August 1946, instituted this program for the selection and training of officer candidates for the Navy and Marine Corps in colleges and universities throughout the country. The cost of tuition, fees, and textbooks will be paid by the Government. Necessary uniforms will be provided by the Government and students will receive subsistence pay for other expenses during college at the rate of \$50 per month for a maximum of four years. Active duty pay while on summer training is based on rate of pay for midshipmen of the Naval Academy (approximately \$172 per month at present).

Normally students will attend college for four years. While in college they may take any course leading to a baccalaureate or higher degree **except** the courses listed on the following page:

Agronomy	Horticulture	Pre-dentistry
Animal Science	Hotel Administration	Pre-medicine
Art	Industrial Arts	Pre-theology
Dairy Manufacturing	Landscape Architecture	Pre-veterinary
Dairy Production	Law	Real Estate
Dairy Science	Medicine	Religion
Dentistry	Music	Soil Conservation
Dramatics	Optometry	Soils
Entomology	Pharmacy	Theology
Floriculture	Physical Education	Veterinary Medicine
General Agriculture	Poultry Science	Wildlife Management

In addition to the requirements of their major, NROTC students are required to complete 30 quarter hours of Naval Science and certain Navy-specified university courses, most of which may be substituted for required or elective courses. Summer quarters are occupied with two at-sea training cruises and one summer period of aviation-amphibious indoctrination, lasting from six to eight weeks each. Upon graduation Regular NROTC students must accept a commission as Ensign, USN, or Second Lieutenant, USMC, if offered.

Entrance to this Regular program described above is effected through the medium of nation-wide competitive examination given by the Naval Examining Section during December of each year for selection of NROTC students to enter the Regular program the following Fall. Application blanks to take the examination and information bulletins describing this program are made available each Fall at all high schools, colleges, and Offices of Naval Officer Procurement. For more complete details, contact the Professor of Naval Science of this university.

2. Contract NROTC students have the status of civilians who have entered into a mutual contract with the Navy. If the student completes successfully the requirements for a degree from Auburn University, plus Naval Science and other Navy-specified courses, he may become a commissioned officer in the Navy or Marine Corps Reserve. Contract students are not entitled to the compensation or benefits paid Regular NROTC students, except that they are entitled to a uniform issue, Naval Science textbooks, subsistence pay (\$50 monthly) during their final two years of NROTC training, and summer cruise compensation. If in all respects qualified, they are commissioned as reserve officers in the United States Navy or Marine Corps upon graduation from Auburn University. They are required to serve on active duty for a period of three years and retain their commission for a total of six years from date of appointment, unless sooner released by the Secretary of the Navy. Contract students selected as Distinguished Naval Graduates will be offered a commission in the regular Navy. Contract students to be commissioned in the Marine Corps may apply for a commission as Regular Officers and, if accepted under current quotas, will have the same options of service as Regular NROTC students.

While at Auburn University a Contract student may take any curriculum which leads to a baccalaureate or higher degree. This does not, however, entitle the student to any delay of active duty requirements after attaining the basic requirements for a baccalaureate degree and commissioning. Contract students are required to complete the same Naval Science and Navy-specified university courses as Regular students. Summer training will consist of an aviation-amphibious indoctrination training period between the sophomore and junior years and an at-sea training cruise between the junior and senior years. During these train-

ing periods Contract students will be paid at the same rate as Regular students. Receipt of subsistence pay of \$50 per month during the junior and senior years in the NROTC program is contingent upon fulfilling the following requirement:

Enlist in the U. S. Naval Reserve (inactive) for the standard six-year reserve obligation. Those students already serving under a reserve enlistment contract will be discharged and re-enlisted under provisions of Section 2104 of Title 10 U.S. Code.

The Reserve Officers Training Corps Vitalization Act of 1964 states that though in an enlisted status during the years enrolled in the advanced Contract program, this time cannot be computed for length of service for a commissioned officer.

Junior and senior Contract NROTC students who are disenrolled from the program for reasons beyond their control or who, without willfully violating the terms of their contract, are disenrolled from the program, will be discharged from their reserve status at the same time, unless they request active duty or retention in the naval reserve.

Contract NROTC students are selected by the Professor of Naval Science prior to the beginning of the Fall Quarter on a basis of demonstrated academic and personal fitness. Applications received prior to September 1st will be considered.

3. Two-Year Advanced-Course Contract NROTC students are eligible to receive all benefits, and are subject to the same conditions of service, as the four-year Contract student who has reached junior status. Program options are available with varying curricular and visual acuity requirements. Applications must be received by March 1 of the sophomore year. Selected applicants will attend a six-week summer training program prior to enrollment in the junior year.
4. Naval Science Students: With the approval of the academic authorities, and with certain exceptions, students disenrolled from the Regular or Contract NROTC programs may be permitted to pursue Naval Science courses for the purpose of fulfilling the university's requirement of six quarters of ROTC. They are not eligible to make NROTC cruises nor to be paid compensation or benefits.

## General Qualifications For Enrollment

In general each candidate for enrollment in the NROTC must meet the following requirements:

1. A Regular NROTC student must be an unmarried male citizen of the United States, never have been married, and agree to remain unmarried until commissioned or disenrolled. (Contract NROTC students may be married.)

2. Have attained his 17th birthday on or before July first of the year of enrollment and be of such age that he will not have attained his 25th birthday before July first of the year he will be commissioned. The Professor of Naval Science is authorized to waive the minimum age requirement for Contract students of the freshman class in those cases where he considers the student of sufficient maturity to undertake the Naval Science courses and drills.

3. Be morally qualified and possess officer qualifications and character as evidenced by appearance, scholarship, extracurricular activities, and record in his home community.

4. Be at least a high school graduate or person of equivalent educational level if selected competitively; or be enrolled in good standing or accepted for admission at an NROTC institution if selected by the Professor of Naval Science.

5. Be physically qualified in accordance with the current manual of the Navy Medical Department requirements for entrance into the NROTC program.

### **Equipment**

Uniforms, Naval Science textbooks, and other equipment necessary to the NROTC program will be furnished by the government to Regular and Contract students. The uniform will be worn only when students are engaged in drills, attending Naval Science labs, or during other naval activities prescribed by the Professor of Naval Science.

### **Selective Service Deferment**

1. Regular and Contract students are draft deferred under the Selective Service Extension Act of 1951 from the time of executing their oath of office or contract. This does **not** remove the legal requirement for all males to register with their local draft board upon reaching age 18.

2. NROTC students dropped from the program become eligible for the draft. Regular students and Advanced-Course Contract students will be discharged from their enlisted status unless they request active duty or retention in the Naval Reserve.

3. The Department of Naval Science will keep the appropriate local draft board informed as to the status of each student under paragraphs 1 and 2 above.

### **Curriculum**

The Naval Science curriculum consists of five hours per week for all courses with the exception of the sophomore courses which consist of three hours per week. Two hours are spent on practical work or drill. The remaining three hours per week are spent in classroom work, except in the sophomore year when one hour is spent in a classroom seminar.

The Naval Science Subjects carried during the four-year curriculum are listed below.

#### **FIRST YEAR**

1st Qtr. Principles of Naval Organization and Management (NS 111)  
2nd Qtr. Principles of Naval Organization and Management/Naval Ship Systems (NS 112)  
3rd Qtr. Naval Ship Systems (NS 113)

#### **SECOND YEAR**

1st Qtr. Seminar: Sea Power and Maritime Affairs (NS 211)  
2nd Qtr. Seminar: Sea Power and Maritime Affairs (NS 212)  
3rd Qtr. Seminar: Sea Power and Maritime Affairs (NS 213)

### **(U. S. N. Candidates)**

#### **THIRD YEAR**

1st Qtr. Navigation (NS 311)  
2nd Qtr. Navigation/Operations (NS 312)  
3rd Qtr. Naval Operations (NS 313)

#### **FOURTH YEAR**

1st Qtr. Naval Weapons I (NS 411)  
2nd Qtr. Naval Weapons I/II or I/III\* (NS 412)  
3rd Qtr. Naval Weapons II or III\* (NS 413)

\*Naval Weapons III will be scheduled by students electing not to complete Calculus. This course is not open to students who complete Calculus.

## (U. S. M. C. Candidates)

**THIRD YEAR**

1st Qtr. Evolution of the Art of War (NS 321)  
 2nd Qtr. Evolution of the Art of War (NS 322)  
 3rd Qtr. Modern Basic Strategy and Tactics  
 (NS 323)

**FOURTH YEAR**

1st Qtr. Amphibious Warfare Part I (NS 421)  
 2nd Qtr. Amphibious Warfare Part II (NS 422)  
 3rd Qtr. Leadership, The Uniform Code of  
 Military Justice (NS 423)

Each of the above subjects carry three quarter hours of credit with the exception of the sophomore courses which carry 1 quarter hour of credit. These hours of credit will be considered as a part of the normal quarterly load required for NROTC students; however, Auburn University graduation requirements will be increased by 18 hours over the number of hours required for students taking only the University-required basic ROTC course.

**Flight and Ground Instruction**

A program of flight and ground instruction is offered eligible NROTC students who have completed their sophomore year. The primary purpose of such instruction is to ascertain the student's aptitude for Naval Aviation but it may also enable students to become eligible for a private pilot's license. Flight training under the program is at Government expense and is in addition to the presently prescribed Naval Science curriculum for NROTC students.

**Naval Honor Graduates**

The Professor of Naval Science may designate as an Naval Honor Graduate any candidate who possesses outstanding qualities of leadership, high moral character, a definite aptitude for the naval service, and who has distinguished himself in his chosen academic major.

In order to qualify for this designation, a candidate must achieve an academic standing in his major field equivalent to "graduation with honor" (grade point average of 2.4 or better) and must also achieve an equivalent standing in aptitude and Naval Science subjects.

**Distinguished Naval Graduate Designation**

In their senior year, Contract NROTC students meeting the following requirements will be designated as a Distinguished Naval Graduate and tendered a regular Navy appointment:

1. Stand in the top 20 percent of the NROTC program OR stand in the top 10 percent in military aptitude and top 1/3 of the NROTC program.
2. Be physically qualified for appointment in the regular Navy.
3. Agree to serve on active duty four years from date of initial appointment.

The top 15 per cent of the total graduates of the Contract NROTC program may be selected as Distinguished Naval Graduates. Selections will be made by a board convened by the Professor of Naval Science.

# Department of Air Force Aerospace Studies

(AFROTC)

COLONEL RITCHIE P. STIMPSON

*Commandant and Professor of Air Force Aerospace Studies*

THE AIR FORCE ROTC was established at Auburn University in the fall of 1946 as the School of Air Science and Tactics. As a result of the ROTC Vitalization Act of 1964, H.R. 9124, the curriculum was revised and the departmental title changed to the School of Air Force Aerospace Studies. During the Fall Quarter, 1967, the title was re-designated Department of Air Force Aerospace Studies. The officer education program under the new legislation is a new program designed to provide education that will develop skills and attitudes vital to the professional Air Force Officer. It is designed to qualify for commission those college men who desire to serve in the United States Air Force.

The curriculum in Air Force Aerospace Studies is divided into two courses, the General Military Course (Basic) and the Professional Officer Course (Advanced). For transfer students there is an off-campus program as a substitute for the basic course. A description of these courses, requirements for entrance, etc. are listed below.

## Financial Assistance Program

Certain outstanding students may be selected by the Professor of Aerospace Studies to compete for grants under the Financial Assistance Program. For students awarded grants, the Government will pay for the cost of tuition, fees, and textbooks. Necessary uniforms will be provided by the Government and students will receive retainer pay at the rate of \$600 per year. Only members of the four year program are eligible for the Financial Assistance Program.

## General Military Course

(Basic Course)

The Air Force course of study normally pursued by the student during his freshman and sophomore academic years is the General Military Course Program. One credit hour is allowed for each quarter of the two-year basic course successfully completed. Corps Training (drill) is scheduled each Tuesday and Thursday from 1:10 to 2:00 p.m.

In the freshman and sophomore years, classroom activity of one hour per week plus one hour of drill is required. Six quarters of classroom activity and six quarters of drill must be successfully completed to satisfy the university's military requirement.

## Field Training Course

Since the General Military Course, or its equivalent, is a requirement for admission to the Professional Officer Education Program, provision has been made for off-campus training for transfer students who



were unable to complete the basic course. These students, after application and acceptance, attend a Field Training Course at an Air Force Base for six weeks during the summer prior to their junior year. This course is an intensified military training program, with classroom work to cover the same material contained in the basic course. At the summer camp, these students are paid approximately \$120 monthly plus travel pay to and from camps. Uniforms, quarters, and rations are furnished by the Government during the training period. Upon successful completion of this course, students are eligible for the Advanced Course.

## **Professional Officer Course**

### **(Advanced Course)**

The Professional Officer Course is designed to provide highly qualified junior officers for the United States Air Force. Enrollment in the program is based upon such factors as leadership, qualification and desire for flying training, academic major, scholastic achievement, and physical qualifications. Successful completion of the course qualifies the student for consideration for appointment as a Second Lieutenant in the USAF.

The program consists of a six-quarter course, normally taken during the junior and senior years. Three credit hours are allowed each quarter. For limitation on credit allowed toward meeting engineering degree requirements, see engineering curricula. Four hours of instruction are taken per week, three classroom periods and one drill period. Students are paid \$50.00 per month while enrolled in the program.

A student selected for enrollment in Category I-P (Pilot) will be given 36½ hours of actual flying and 35 hours of ground instruction, which may qualify him for a private flying certificate.

A summer field training period of four weeks duration must be attended by the advanced student if he has not successfully completed a six-week Field Training Encampment prior to entering the Professional Officers Course (POC). (See Paragraph 10 below). Summer training is normally accomplished during the summer between the junior and senior years. Uniforms, quarters, and rations are furnished by the government during the training period as well as travel expenses to and from camp. Cadets are paid approximately \$120 per month while attending the summer training unit.

Requirements for admission to the Professional Officer Course are as follows:

1. Be a United States citizen.
2. Be physically qualified in accordance with standards prescribed by the Department of the Air Force.
3. Be under 28 years of age at time of graduation and completion of the Advanced Course.
4. Students desiring to qualify for an Aeronautical rating in the USAF must not have reached 26½ years of age at time of graduation and completion of the Advanced Course, and must accept an appointment to an Air Force Flight Training School.

5. Usually have two academic years remaining either in undergraduate or graduate status, or a combination of the two.
6. Have an academic average of 1.0 or higher.
7. Be selected by the Professor of Aerospace Studies.
8. Must execute a written agreement to complete the two year Advanced Course training and to attend one summer training session (four weeks). Upon completion of the advanced course must accept an appointment in the Air Force in the grade of Second Lieutenant, if tendered, and must agree to serve on active duty as a commissioned officer with the United States Air Force, for not less than four years, in the case of Category II (Scientific and Engineering) and Category III (General) cadets and not less than six years, in the case of Category I-P (Pilot) and Category I-N (Navigator). (Veterans are exempt from this active duty requirement.)
9. Must enlist in the Air Force Reserve for a period of not less than six years (eight years for students in the Financial Assistance Program).
10. Have completed six quarters of basic training or a six-week Field Training Encampment, or have equivalent credit in lieu thereof, and have attained qualifying scores on Air Force Officer Qualifying Tests.
11. Veterans who desire to enroll in the Advanced Course on the basis of previous honorable active U.S. military service must request a waiver of the Basic Course, or portion thereof as a requirement for entrance. If a student meets all other requirements, he will be enrolled at the beginning of his junior year.

## **Uniforms and Equipment**

All students are required to deposit \$30.00 with the Bursar of the University prior to enrollment in the AFROTC. They are furnished a uniform in good condition and other necessary uniform items through the AFROTC Supply Office under the uniform commutation system. Texts and other items required for AFROTC academics are also issued through the AFROTC Supply Office. Upon completion of the AFROTC Course of instruction, or upon withdrawal of the student therefrom, the uniform and all other supplies are turned in and the deposit returned to the student, less \$1.50 per quarter withheld by the Bursar of the University to cover the cost of cleaning and repair of the uniforms when applicable and to support AFROTC activities as follows: Special apparel and equipment for competitive drill teams; sponsors uniforms; approved travel for drill teams and AFROTC sponsored drill teams and honoraries representing Auburn University; the official Military Ball in an amount not to exceed \$.40 per cadet enrolled that quarter.

## **Distinguished AFROTC Graduates**

Distinguished AFROTC Graduates will be considered for appointment in the Regular Air Force. This appointment is the same as commissions received from the Air Force Academy. All other AFROTC graduates will be tendered reserve commissions.

The Professor of Air Force Aerospace Studies may designate as a Distinguished AFROTC Graduate a cadet who:

1. Possesses outstanding qualities of leadership and high moral character.

2. Demonstrates leadership ability through achievements while participating in recognized campus activities, both curricular and extra-curricula.

3. Has a standing in his academic and military classes which, in conjunction with (1) and (2), above, warrants designation as "Distinguished," and consideration for an appointment in the Regular Air Force.

# Description of Courses

This section contains all courses offered in the University, listed by departments, arranged in alphabetical order.

Those courses bearing the numbers 100 to 199, inclusive, are normally offered for freshmen; those from 200 to 299, sophomores; 300 to 399, juniors; 400 to 499, seniors; 500 to 599, fifth year students; 600 to 799, graduate students.

Description of courses in each department includes: (a) course number; (b) descriptive title; (c) in parentheses, credit in quarter hours, i.e. one quarter (5), two quarters (5-5), etc.; (d) lecture and laboratory hours for courses with laboratory (where no statement is made the course consists of lecture periods equal in number to course credit); (e) the quarter in which the course is offered; (f) prerequisite (Pr.); (g) description of subject matter and method.

Preceding the description of courses for each department is a list of the departmental faculty.

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Civil Engineering (CE).....	219	Nutrition and Foods (NF).....	285
Consumer Affairs (CA).....	222	Pharmacy (PY).....	287
Counselor Education (CED).....	225	Philosophy (PA).....	291
Dairy Science (DH).....	226	Physics (PS).....	292
Economics (EC).....	228	Political Science (PO).....	296
Electrical Engineering (EE).....	230	Poultry Science (PH).....	298
Elementary Education (EED).....	234	Psychology (PG).....	299
Engineering Graphics (EG).....	236	Secondary Education (SED).....	301
English (EH).....	237	Sociology (SY).....	304
Family and Child Development (FCD).....	240	Speech (SP).....	305
Foreign Languages (FL).....	242	Textile Engineering (TE).....	309
Forestry (FY).....	245	Theatre (TH).....	310
Foundations of Education (FED).....	248	Veterinary Medicine (VM).....	312
Geography (GY).....	230	Vocational, Technical, and Practical Arts Education (VED).....	318
Geology (GL).....	250	Zoology-Entomology (ZY).....	322

## University Courses (U)

The following courses, to be offered for the first time in 1969-70, initiate a series of courses, interdisciplinary and experimental in character, which are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

400. **Psychological Study of the Community (3).** Lec. 2, Lab. 2. Pr., Junior Standing and Permission of Instructor.  
Local community programs designed to foster interest in and an understanding of our society. A number of community leaders will be used as speakers and discussion leaders.
422. **Natural Philosophy (3).** Pr., junior standing.  
A synthesis of modern thought concerning the unifying ideas of physical and biological sciences and their impact on the social-economic structure of man-made society. Contributions from various sciences are evaluated in light of knowledge of the last part of the twentieth century.

## Accounting and Finance (ACF)

*Professors Hartman, Henderson*  
*Associate Professors Gritz, D. P. Hale, Hill, Stalnaker*  
*Assistant Professors Bice, Criss, Williams*  
*Instructors Beard, Becker, Dinius*

### Accounting

- 211-212. **Introductory Accounting (5-5).** Lec. 3, Lab. 4. Pr., sophomore standing.  
Bookkeeping procedure and elementary accounting principles. ACF 211 is prerequisite to ACF 212. ACF 211 not open to students having credit in ACF 215.
215. **Fundamentals of General and Cost Accounting (5).** Lec. 3, Lab. 4. Pr., sophomore standing.  
The fundamental concepts and principles of general and cost accounting with emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in BA. Credit in ACF 211 excludes credit for ACF 215.)
310. **Financial Accounting and Control (5).** Pr., ACF 212.  
The third course for accounting majors or a terminal course for non-accounting majors. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems.
- 311-312. **Intermediate Accounting (5-5).** Lec. 3, Lab. 4. Pr., ACF 212.  
The advanced principles of accounting involving partnerships, corporations, systems, and analysis of financial statements.
314. **Income Tax Accounting (5).** Pr., ACF 212.  
Interpretation of the regulations, preparation of returns, and the keeping of accounting records for tax purposes will be considered in this course.
- 411-412. **Cost Accounting (5-5).** Lec. 2, Lab. 6. Pr., ACF 312, and junior standing.  
Accounting principles involved in job-lot, process, and standard cost accounting.
414. **Advanced Income Tax Accounting (5).** Pr., ACF 312, 314, and junior standing.  
Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
416. **Auditing (5).** Pr., ACF 312, and junior standing.  
The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
- 417-418. **Advanced Accounting (5-5).** Lec. 2, Lab. 6. Pr., ACF 312, and junior standing.  
Advanced accounting theories and procedures, consolidation of financial statements, and other special problems will be studied in this course.
419. **Governmental Accounting (5).** Pr., ACF 312, and junior standing.  
Budgeting and accounting procedures of governmental divisions.

### GRADUATE COURSES

610. **Managerial Accounting (5).** Pr., ACF 212, and graduate standing or consent of instructor.  
Primarily non-technical, for the student who will be confronted with business problems requiring a comprehensive understanding of accounting concepts, and the accepted methods of applying these concepts in decision-making, planning, and control.

611. **Advanced Accounting Theory (5).** Pr., ACF 312 and graduate standing or consent of instructor.  
A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
614. **Accounting Systems (5).** Pr., ACF 414, and consent of instructor.  
Systems used in various types of business operations.
616. **Advanced Auditing (5).** Pr., ACF 416 and graduate standing or consent of instructor.  
Application of auditing principles and procedures to practical problems encountered in the field of public and private accounting.
617. **Advanced Accounting Problems (5).** Pr., ACF 417 and graduate standing or consent of instructor.  
An extension to and a consolidation of all the other advanced accounting courses. Preparation for special accounting examination.

### Finance

321. **Property Insurance (5).** EC 200 and junior standing.  
The principles, uses and types of insurance with particular emphasis on fire, marine, automobile and casualty lines.
322. **Life Insurance (5).** Pr., EC 200, junior standing.  
The organization of the life insurance business and the various types of contracts.
323. **Real Estate (5).** Pr., EC 200, junior standing.  
The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title and management of real estate.
340. **Personal Finance (3).** General elective. Pr., junior standing.  
Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc.
361. **Principles of Business Finance (5).** Pr., EC 202 and ACF 212.  
The first course in Business Finance with emphasis on short-term, intermediate, and long-term financing of business firms.
464. **Investments (5).** Pr., ACF 361, junior standing.  
Individual investment policies, investment institutions, and types of investments available.

### GRADUATE COURSES

663. **Advanced Corporation Finance (5).** Pr., ACF 361.  
Intensive study of theory and problems of business finance from a decision-making, internal, problem-solving point of view.

### Administration and Supervision (AED)

*Head Professor Pharis*  
*Professors Pierce and Saunders*  
*Associate Professors Jordan, Morgan, Teague, and Tincher*  
*Assistant Professors Clark, Moore, Walden*

Prerequisites and corequisites in the Department of Administration and Supervision are: experience in teaching or appropriate fields, employment or definite professional objectives leading to employment in administration or supervision; and AED 681 or equivalent as a prerequisite or corequisite to advanced study in any of the specialized areas.

618. **Organization and Administration of Higher Education (5).** Pr., IED 663 or IED 665, or permission of the instructor.  
For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relationships between higher education and the state and federal government.
645. **Current Problems and Issues in Educational Administration (5).**  
The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
646. **Studies in Education (1-3).** Pr., one quarter of graduate study and departmental approval.  
A special problem in administration, supervision, guidance, or higher education using research techniques. (Credit in ED 651 prior to 1960 excludes credit for this course.)



650. **Seminar in Area of Specialization (1-5).** Pr., permission of the instructor.  
Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
651. **Internship in Area of Specialization (1-15).** Pr., permission of the instructor; may be repeated for a total of not more than 15 credits.  
Provides advanced graduate students with full-time, supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences are accompanied by regularly scheduled, on-campus discussion periods, designed to provide positive evaluation and analysis of the field experience.
659. **Practicum in Area of Specialization. (Credit to be arranged.)** No more than 10 hours of practicum credit may be earned at Master's Level. Pr., permission of major professor.  
Provides advanced graduate students with supervised experiences with emphasis on the application of concepts, principles, and skills acquired in previous course work.
670. **Supervision of the Instructional Program (5).**  
Assists superintendents, supervisors, principals, teachers, and other educational leaders in understanding the meaning, purpose and function of supervision, the basic factors in the improvement of teaching, and in understanding and evaluating the various concepts of educational leadership as they apply to the improvement of teaching effectiveness.
681. **Organization and Administration of Public Education (5).**  
For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction, and personnel administration.
683. **The Leadership Role in Educational Administration (5).**  
Current theories, concepts and principles of leadership and their application to education. Further emphasis placed on the responsibility of the educational administrator for leadership in the school and community, in the continuous improvement of staff competence and principles, and in evaluation of effective leadership.
685. **Administrative Organization and Behavior (5).**  
Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing for instruction.
686. **Administration and Policy Formation (5).**  
Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
688. **School Finance and Business Administration (5).**  
Relationships between educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.
689. **Educational Plant Maintenance (5).**  
Relationship of educational plant maintenance and operation to educational program; procedures in educational plant maintenance and operation; safety factors; trends in modernization and new plant planning.
690. **Educational Business Management (5).**  
Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.
691. **Educational Plant Planning (5).**  
Development of educational plants; relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.
692. **Constitutional, Statutory and Judicial Foundations of Education (5).**  
The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation; curriculum, contracts and retirement provisions; contractual capacity and liability, and transportation.
693. **Personnel Administration (5).**  
Assists educational leaders with effective personnel administration and the quality of education. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.
697. **Student Personnel Work in Higher Education (5).** Pr., AED 621.  
Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.
699. **Research and Thesis (Credit to be arranged).** May be taken more than one quarter.
798. **Research and Thesis (5).**
799. **Research and Dissertation (Credit to be arranged).**

**Aerospace Engineering (AE)***Head Professor Pitts**Professors Martin and Sforzini**Associate Professors Bennett, Cutchins, Drummond, Harwell, and Sherling**Assistant Professors Burkhalter, Nichols\*, and Pell**Instructor Culberson*

203. **Aerospace Fundamentals (3).** Lec. 2, Lab. 3. Pr., EG 106.  
Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and IE 204 or similar courses which include FORTRAN programming instruction.
300. **Aerospace Analysis I (3).** Pr., MH 265.  
Special methods and notations used in Aerospace Engineering.
302. **Airloads (4).** Lec. 3, Lab. 3. Pr., ME 340.  
Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
303. **Theoretical Aerodynamics I (3).** Pr., ME 340 and AE 300.  
Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
304. **Theoretical Aerodynamics II (4).** Lec. 3, Lab. 3. Pr., AE 303.  
Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
305. **Flight Performance (2).** Pr., AE 302.  
Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.
307. **Aerospace Structures I (5).** Lec. 4, Lab. 3. Pr., ME 207.  
Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
310. **Aerospace Analysis II (4).** Pr., AE 300, ME 321.  
Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Transfer functions and stability criteria for some aerospace systems and components. Other special techniques as required by advanced courses.
311. **Aerospace Materials and Methods of Construction (3).** Pr., ME 202 and junior standing.  
Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
335. **Rotary Wing Aerodynamics (3).** Pr., AE 304, AE 305.  
Aerodynamics and flight characteristics of the rotary wing as applied to helicopters and V/STOL flight vehicles.
400. **Viscous Aerodynamics (4).** Lec. 3, Lab. 3. Pr., AE 304, junior standing.  
Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.
401. **Aeronautical Problems I (1).** Lab. 3. Pr., senior standing.  
Investigation of current aeronautical problems; preparation and presentation of technical papers and reports.
402. **Aeronautical Problems II (1).** Lab. 3. Pr., AE 401.  
Continuation of AE 401.
409. **Aerospace Structures II (5).** Lec. 4, Lab. 3. Pr., AE 307, AE 310.  
A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.
414. **Equilibrium Gas Dynamics (3).** Pr., permission of instructor and junior standing.  
Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties. Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.
415. **Jet Propulsion (5).** Pr., junior standing, AE 304.  
Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.
416. **Rocket Propulsion I (3).** Pr., AE 415, junior standing.  
Detailed analysis of the thermodynamics, aerodynamics, and design of liquid propulsion rockets.

\*On study leave to September 1, 1969.

417. **Rocket Propulsion II (3).** Pr., AE 415, junior standing.  
Design and performance analysis of solid propellant rocket motors with emphasis on internal ballistics.
420. **Flight Vehicle Stress Analysis I (3).** Pr., junior standing and AE 409.  
Computer techniques applied to the analysis of flight vehicle structures.
421. **Flight Vehicle Stress Analysis II (3).** Pr., junior standing and AE 409.  
Stress analysis of pressure chambers and vessels encountered in aerospace applications.
424. **Nonequilibrium Gas Dynamics (3).** Pr., permission of instructor and junior standing.  
Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.
428. **Space Propulsion Systems (5).** Pr., junior standing and AE 415.  
Introduction to reaction engines for use in, outer space vehicles. Environment of outer space, power requirements for space missions, introduction to relativistic mechanics, nuclear power systems, particle generators, magnetohydrodynamics, plasma accelerators and photonic engines.
429. **Aircraft Vibration and Flutter (5).** Pr., AE 302, AE 310, AE 409, junior standing.  
Lagrange's equations of motion; free, forced, and damped vibrations of single and multiple degree-of-freedom systems; introduction to vibrations of continuous systems; introduction to flutter theory; applications in aerospace.
432. **Astrodynamics I (3).** Pr., ME 321 and AE 310 or permission of instructor, junior standing.  
Geometry of planetary motion; review and extensions of vector mechanics; detailed analysis of two-body dynamics and introduction to ballistic and artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories.
433. **Astrodynamics II (3).** Pr., AE 432, junior standing.  
Elements of special and general perturbation theory; n-body formulation and introduction to 3-body problem; introduction to powered flight analysis and space flight guidance.
434. **Aerospace Systems Analysis (3).** Pr., AE 429 or AE 441 or AE 432, junior standing.  
Modeling of system elements, analysis of systems undergoing various motions connected with flight, and techniques of optimization of the system.
435. **Elements of V/STOL Flight (3).** Pr., AE 335, AE 400 or permission of instructor, junior standing.  
The analysis of methods for generating high lift at low vehicle forward speeds. Physical flaps, jet flaps, ducted propellers, wing in propeller slipstream, boundary layer control, thrust augmentation and jet deflection.
439. **Static Stability and Control (3).** Lec. 2, Lab. 3. Pr., AE 304.  
Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.
441. **Dynamic Stability and Control (3).** Pr., AE 439, junior standing.  
Longitudinal and lateral dynamics of aircraft. Response to actuation of controls. Attitude dynamics of spacecraft. Emphasis on design considerations of various vehicles.
442. **Automatic Stability and Control (3).** Pr., AE 441 and junior standing.  
Introduction to principles and techniques of automatic control of aircraft and missiles. Effects on design variables.
445. **Missile Aerodynamics (3).** Pr., AE 400, AE 439, junior standing.  
The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.
448. **Aerospace Design I (1).** Lab. 3. Pr., AE 311.  
The design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449. Either AE 448 or 449 may be taken first but they may not be taken concurrently.
449. **Aerospace Design II (1).** Lab. 3. Pr., AE 311.  
The design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 448. Either AE 448 or 449 may be taken first but they may not be taken concurrently.

## GRADUATE COURSES

601. **Advanced Supersonic Aerodynamics (5).** Pr., AE 400.  
A continuation of AE 400 High Speed Aerodynamics. Consists of a rigorous development of linearized and nonlinearized compressible fluid flow and application. Lifting surfaces, lifting bodies, duct flow and boundary layer effects.
602. **Advanced Elements of High Speed Aerodynamics (5).** Pr., AE 601 or equivalent.  
A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.

603. **High-Speed Viscous Aerodynamics (5).** Pr., AE 602 or equivalent.  
A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.
605. **Aeroelasticity (3-5 hours credit to be arranged).** Pr., AE 429. May be taken more than one quarter, not to exceed 10 hours.  
General formulation of aeroelastic problems, buffeting, flutter and loss of control, dynamic stresses.
608. **Aerospace Structural Dynamics (3-5 hours credit to be arranged).** Pr., AE 429.  
Advanced theory of matrix structural analysis with applications to dynamics of flight.
609. **Advanced Aero-Structures (3).** Pr., AE 429.  
Vibrations of solids and wave propagation, introduction to general methodology and thermodynamics of solids, derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.
610. **Advanced Vibrations Phenomena (3-5 hours credit to be arranged).** Pr., AE 429.  
Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.
611. **Thrust Generation (5).** Pr., AE 415.  
Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.
612. **Aerothermochemistry of Propulsion (3-5 credit hours to be arranged).** Pr., AE 611 or permission of instructor.  
Selected topics emphasizing interrelation between internal aerodynamics and combustion phenomena in air breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.
613. **Advanced Air-Breathing Propulsion (3-5 credit hours to be arranged).** Pr., AE 611 or permission of instructor.  
Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.
615. **Hypersonic Flow Theory (3-5 hours credit to be arranged).** Pr., AE 400, Coreq., MH 461. May be taken more than one quarter, not to exceed 15 hours.  
Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.
616. **Real Gas Dynamics (3-5 hours credit to be arranged).** Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
A microscopic approach to the study of gas dynamics based on quantum mechanical models and statistical techniques.
617. **Molecular Theory of Aerodynamics (3-5 hours credit to be arranged).** Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
619. **Dynamics of Flight (5).** Pr., AE 439. Corequisite, MH 661.  
Small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivative, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions, solutions of the dynamic stability problems by electronic computing devices, inverse problem, automatic stability and control.
620. **Flight Dynamics of Hypervelocity Vehicles (3-5 hours credit to be arranged).** Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated; static stability problems of hypervelocity vehicles are discussed.
631. **Advanced Astronautics (5).** Pr., AE 433 or permission of instructor.  
Advanced astrodynamics and trajectory theory; n-body problems; perturbation forces and effects; orbital transfer and trajectory optimization; theory of space guidance. A continuation of AE 433 at the graduate level.
632. **Advanced Astrodynamics (3-5 credit hours to be arranged).** Pr., AE 433 or permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theory, oblate earth problem, three body problem, mission analysis methods, and new research developments.

635. **Ion and Plasma Propulsion (5).** Pr., permission of instructor.  
Basic physical and gas dynamic processes underlying methods for electrical acceleration of ionized gas flows appropriate to electrothermal propulsion, electrostatic propulsion, electromagnetic propulsion.
639. **Particle Kinetics of Plasmas (3-5 hours credit to be arranged).** Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
Gaseous plasmas based on the theory of individual particle kinetics. Emphasis will be placed on the development of basic concepts with sufficient generality to allow treatment of non equilibrium problems of interest in aerospace research.
640. **Magneto-Gas Dynamics (5).** Pr., permission of instructor.  
Review of electrodynamics, Maxwell stresses, field and momentum-energy tensors. Thermodynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
645. **Shock Tube Theory and Techniques (5).** Pr., permission of instructor.  
Shock wave theory in real and perfect gases, expansion wave theory, reflected shock wave theory. Basic shock tube equations; effects of area change, driver types and characteristics. Non-ideal behavior in shock tubes, diaphragm opening effects, boundary layer effects, shock wave attenuation. Testing time derivation. Shock tube techniques and measurements.
646. **Plasma Diagnostics (3-5 hours credit to be arranged).** Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.  
Theoretical and applied studies of techniques for the measurement of plasma properties. The application of these techniques to aerospace research and testing.
690. **Seminar. Credit to be arranged. May be taken more than one quarter.**  
Provides weekly lectures on current developments in aerospace sciences by staff members, graduate students, and visiting scientists and engineers.
691. **Directed Reading in Aerospace Engineering. (Credit to be arranged, not exceeding 5 hours.) May be taken more than one quarter.**
699. **Research and Thesis. Credit to be arranged.**

### Aerospace Studies (AF)

101. **World Military Systems (1). Lec. 1, Lab. 1.**  
Develops a fundamental knowledge of the nature and principles of war, factors of national power, and instruments of national power.
102. **World Military Systems (1). Lec. 1, Lab. 1.**  
An examination of the Department of Defense's organizational structure with emphasis on the United States Air Force.
103. **World Military Systems (1). Lec. 1, Lab. 1.**  
Strategic offensive and strategic defensive forces.
201. **U.S. General Purpose Forces (1). Lec. 1, Lab. 1.**  
The mission, organization, and functions of United States General Purpose Forces.
202. **U.S. Aerospace Support Forces (1). Lec. 1, Lab. 1.**  
Mission, organization, and functions of the U.S. Air Force's support commands.
203. **Trends and Implications in the Pursuit of Peace (1). Lec. 1, Lab. 1.**  
The fundamental conflicts between democracy and communism to include an inquiry into world alliances and collective security.
301. **Growth and Development of Aerospace Power (3). Lec. 3, Lab. 1.**  
Communicative techniques utilized by students in the POC and the development of airpower from the beginnings of manned flight to 1961.
302. **Growth and Development of Aerospace Power (3). Lec. 3, Lab. 1.**  
Current and probable future airpower concepts and doctrine and an introduction to astronautics and space operations.
303. **Growth and Development of Aerospace Power (3). Lec. 3, Lab. 1.**  
A continuation of astronautics and space operations with the emphasis on space vehicle systems and space operations.
401. **Military Leadership and Discipline (3). Lec. 3, Lab. 1.**  
The need for Air Force leadership and for discipline in the military.
402. **Leadership and Management Skills (3). Lec. 3, Lab. 1.**  
The variables affecting leadership and an introduction to military management to include planning and organizing.
403. **Military Management and Pre-Commissioning (3). Lec. 3, Lab. 1.**  
Continuation of military management to include coordination, directing, and controlling; and pre-commissioning.

## Agricultural Economics and Rural Sociology (AS)

*Professors Yeager, Blackstone, Danner, White, and Wilson*

*Associate Professors Bell and Dunkelberger*

*Assistant Professors Clonts and McCoy*

202. **Agricultural Economics (5). All quarters. Pr., sophomore standing.**  
Economic principles in changes and trends in farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies, tenure, etc., and with utilization of land, labor, and capital.
301. **Agricultural Marketing (5). Pr., AS 202 or EC 200.**  
Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
302. **Farm Records (3). Pr., AS 202 or EC 200.**  
Farm records and accounts and their uses. Kinds and systems of records and accounts adapted to use on farms.
303. **Agricultural Cooperatives (3). Pr., AS 202.**  
Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
304. **Agricultural Finance (3). Pr., AS 202.**  
Economic problems and policies in financing agriculture.
305. **Farm Appraisal (3). Pr., AS 202.**  
The theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, soils, crops, forestry management, buildings, land titles, farm prices, taxes, and interest rates to land values; actual appraisals of selected farms; evaluation of appraisal methods and forms currently in use.
361. **Rural Sociology (5). Pr., sophomore standing.**  
The basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.
362. **Community Organization (5). General elective.**  
Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.
370. **Methods of Social Research (5). Pr., AS 361 or SY 201.**  
The principal methods of data collection and analysis in sociological research. Same course as SY 370. Credit in AS 370 excludes credit in SY 370.
401. **Farm Management (5). Pr., AS 202 or EC 200 and junior standing.**  
Principles and problems in acquiring, organizing, and operating a successful farm business. Formation and integration of family and farm business goals.
403. **Agricultural Prices (3). Pr., AS 202 or EC 200 and junior standing.**  
Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.
405. **Agricultural Policy (3). Pr., AS 202 or EC 200 and junior standing.**  
Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.
409. **Land Economics (5). Pr., AS 202 or EC 200 and junior standing.**  
Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.
410. **Agricultural Business Management (3). Pr., AS 202 or EC 200 and junior standing.**  
Principles and problems involved in acquiring, organizing and operating successful agricultural businesses; capital requirements for selected agricultural businesses, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation; practices involved in buying, pricing, and merchandising; management problems and policies in financing, personnel, and public relations.
411. **Economic Development of Rural Resources (3). Pr., AS 202 and junior standing.**  
Theoretical and empirical study of economic growth and development; problems of undeveloped and underdeveloped areas; role of agriculture in a developing economy; examination of the policies and programs for effective economic growth and development.
412. **Economic Aspects of Water Resources Management (5). Pr., junior standing.**  
The supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.



420. **Cooperation in Agriculture (3).** Lec. 4. Pr., graduate standing or consent of instructor.  
Includes cooperative and economic theory as well as economic and legal aspects of co-operatives. (A course designed primarily for credit at off-campus centers.)
441. **History and Philosophy of Extension (3).** Lec. 4. Pr., junior standing.  
The Cooperative Extension Service as an educational institution. This course can meet the needs of students preparing for work in Cooperative Extension as well as those currently so engaged. (Credit in HE 401 excludes credit in this course.)
460. **Introduction to Econometrics (3).** Pr., MH 122 or equivalent, EC 245 or equivalent, and AS 202 or equivalent, and junior standing.  
Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.
461. **Rural Social Organization (5).** Pr., AS 361 or SY 201 and junior standing.  
Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness. (When taught off-campus, course will carry 3 hours credit).
462. **Sociology of Community Development (5).** Pr., AS 361 or SY 201 and junior standing.  
Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U. S. and world is considered with emphasis on small population centers.
480. **Agricultural Commodity Marketing. A. Livestock, B. Dairy, C. Poultry, D. Crops Marketing (3).** Pr., AS 202 or EC 200 and junior standing. May be taken up to a maximum of 12 hours but work may not be repeated in any one area.  
Economic analysis of market movement and pricing, functional analysis, and institutional aspects of marketing major products in each category.
490. **Senior Seminar (1).** Lec. 1. Pr., senior standing.  
Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.

## GRADUATE COURSES

601. **Advanced Farm Management (5).** Pr., graduate standing or consent of instructor.  
Advanced theory and application of farm management principles and other economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.
602. **Advanced Agricultural Prices (5).** Pr., EC 245 and graduate standing or consent of instructor.  
Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.
603. **Advanced Land Economics (5).** Pr., graduate standing or consent of instructor.  
Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.
605. **Advanced Agricultural Marketing (5).** Pr., graduate standing or consent of instructor.  
Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.
606. **Agricultural Market Organization (5).** Pr., EC 451 and graduate standing or consent of instructor.  
The theoretical approach to marketing problems characterized by imperfectly competitive structures and multiple markets separated by time, space, and form attributes. Theory of interregional trade and location of economic activity. Efficiency of firms and product movement.
608. **Economics of Agricultural Production (5).** Pr., EC 451 and graduate standing or consent of instructor.  
Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between agriculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty including price instability, institutional changes, technological advances, imperfect knowledge of production methods, and variations in the human element with emphasis on the role of management.
609. **Dynamics of Agricultural Production and Management (5).** Pr., AS 608 and graduate standing or consent of instructor.  
Dynamics of resource allocation and efficiency of production as influenced by price, institutional, and technological changes. Imperfect knowledge and the human element in management.
616. **Resource Economics, Policies and Programs (5).** Pr., graduate standing or consent of instructor.  
Impact of resource development on regional economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.

620. **Directed Readings in Regional Planning (5).** Pr., graduate standing or consent of instructor.  
Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.
641. **Extension Methods (3).** Lec. 4. Pr., AS 441 or the equivalent.  
Extension programs are reviewed and related to effective program accomplishment for particular objectives and under different conditions that might prevail.
642. **Extension Programs (3).** Lec. 4. Pr., AS 441 or the equivalent.  
The over-all Extension organization and its relation to the steps and procedures of program development and evaluation. Designed particularly to meet the needs of persons responsible for Extension program development and evaluation at the county level.
651. **Farm Organization and Management (3).** Lec. 4. Pr., graduate standing.  
Formation and integration of family and farm business goals; acquisition, organization, operation and management of successful farm businesses; organization and management of efficient farm units. (Credit for both AS 651 and AS 601 may not be used to meet requirements for the Master's degree.)
652. **Agricultural Prices and Marketing (3).** Lec. 4. Pr., graduate standing.  
Principles and problems in marketing agricultural products. Objectives in agricultural marketing. Factors involved in the pricing process of agricultural products and markets. (Credit for both AS 652 and AS 602 may not be used to meet requirements for the Master's degree.)
653. **Public Policy in Agriculture (3).** Lec. 4. Pr., graduate standing.  
Concepts, objectives, and operation of public policies affecting agriculture; development of agricultural policies in the United States; alternative methods of dealing with farm problems and opportunities at national, state, and local levels.
662. **Social Organization and Communities (3).** Lec. 4. Pr., graduate standing.  
The organization of rural society and an application of the group dynamics perspective to rural community life, problems in rural living, and proposals for facilitating action programs in rural areas.
670. **Research Methods in Agricultural Economics and Rural Sociology (3).** Pr., graduate standing and consent of instructor.
680. **Special Problems in Agricultural Economics and Rural Sociology.** Credit to be arranged.
690. **Seminar (1-1-1).** Fall, Winter, Spring.
699. **Research and Thesis.** Credit to be arranged.

### **Agricultural Engineering (AN)**

*Professor Kummer*

*Associate Professor Renoll*

*Assistant Professors Hermanson, Lalor, and Koon*

*Research Lecturers Cooper, Gill, Nichols, Reaves, and Taylor*

101. **Engineering and Agriculture (1).** Lec. 1.  
The role of engineering in agriculture.
102. **Agricultural Engineering Profession (1).** Lec. 1.  
Developments in the major fields of agricultural engineering.
301. **Mechanics of Farm Machines (3).** Lec. 2, Lab. 3. Pr., ME 321, MH 265, IE 205.  
Basic concepts and engineering principles of farm machinery, including basic design, power needs and their measurement, functional and economic analyses, utilization and management, testing, and safety as related to farm machines.
302. **Mechanics of Tractor Power (3).** Lec. 2, Lab. 3. Pr., ME 321, ME 265, ME 301, IE 205.  
Basic concepts and engineering principles of the farm tractor, including mechanics of the tractor, stability, traction, weight transfer, thermal efficiency, energy sources, economics, safety, testing and power measurement as related to tractors and power units.
303. **Soil and Water Engineering I (4).** Lec. 3, Lab. 3. Pr., ME 340, IE 205.  
Surveying procedures and application to soil and water problems. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design.
304. **Drainage and Irrigation Engineering (3).** Lec. 2, Lab. 3. Pr., AN 303.  
Soil-water-plant relationships. Theory and design of drainage systems. Irrigation systems design. Water quality and supply. Legal and economic aspects.
305. **Agricultural Processing Engineering (3).** Lec. 3. Pr., ME 301, ME 340.  
Introduction to process engineering, fundamental concepts, theory of unit operations such as pumps, fans, size reduction, cleaning, bulk movement, and heat transfer and mass transfer.

306. **Electrical Systems in Agriculture (3).** Lec. 3. Pr., EE 273, Coreq., EE 381.  
Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.
307. **Agricultural Structures Design I (3).** Lec. 2, Lab. 3. Pr., ME 207.  
Analysis and design of structural systems of agriculture.
350. **Soil and Water Technology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer.  
Technical application of soil and water resources management. Irrigation system planning and equipment selection.
351. **Agricultural Machinery Technology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer.  
Agricultural machinery: utilization, management, selection, and economic justification.
352. **Tractor and Engine Technology (5).** Lec. 4, Lab. 3. Winter.  
Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.
353. **Farm Building Technology (5).** Lec. 4, Lab. 3. Winter.  
Selection of materials, methods of construction and functional needs of modern farm buildings.
354. **Agricultural Processing Technology (5).** Lec. 4, Lab. 3.  
Agricultural processing systems; includes storing, drying, pelleting, mixing and automatic materials handling systems.
401. **Agricultural Power and Machinery Design (3).** Lec. 2, Lab. 3. Pr., AN 301, AN 302 and junior standing.  
Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.
403. **Soil and Water Engineering II (3).** Lec. 2, Lab. 3. Pr., AN 304 and junior standing.  
Small watershed hydrology. Open channel hydraulics applied to the design of irrigation, drainage, and erosion control facilities. Hydraulic design of conduits, and stilling basins.
405. **Electrical and Processing Systems Design (3).** Lec. 3. Pr., AN 305, AN 306 and junior standing.  
Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
407. **Agricultural Structures Design II (3).** Lec. 3. Pr., AN 307 and junior standing.  
Functional requirements and design of animal shelters and agricultural storage buildings.
- 410-11. **Special Problems (3-3).** Pr., Faculty advisor approval and AN 301-07.  
Individual student endeavor supervised by instructor involving special Agricultural Engineering topics to which the engineering electives selected by the student will be complementary.
422. **Farm Power and Equipment (5).** Summer. Half-quarter course. Pr., AN 303, junior standing. For Vocational Agriculture Teachers.
424. **Farm Electrification (5).** Summer. Half-quarter course. Pr., junior standing. For Vocational Agriculture Teachers.
426. **Farm Irrigation (5).** Summer. Half-quarter course. Pr., junior standing. For Vocational Agriculture Teachers.
432. **Engineering in Agriculture I—Agricultural Machinery (3).** Lec-Dem. 4. Pr., graduate standing.  
The utilization of modern agricultural machinery on the farm with emphasis on safety, management, costs, economic justification, and principles of operation. (Credit for both AN 432 and AN 422 may not be used to meet requirements for the Master's degree.)
434. **Engineering in Agriculture II—Agricultural Power (3).** Lec-Dem. 4. Pr., graduate standing.  
Farm tractor and power units used on the farm; includes the basic principles of operation with major interest toward lubrication, costs, operational problems, safety and a comparison of gasoline, Diesel, and L.P. gas fuels, and units. (Credit for both AN 434 and AN 422 may not be used to meet requirements for the Master's degree.)

## COURSES PRIMARILY FOR GRADUATE STUDENTS

601. **Advanced Small Watershed Hydrology (4).** Pr., AN 403, CE 412.  
Hydrograph synthesis. Mathematical modeling of runoff and streamflow. Probability analysis of hydrologic events. Design of upstream systems for flood and erosion control and water supply.
602. **Advanced Farm Power and Machinery (5).** Arrange. Pr., AN 201 and 401.  
Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.

603. **Erosion and Sediment Transport (4).** Pr., AN 403.  
Mechanics of overland flow and the initiation of sediment movement. Analysis of alluvial channel flow. Theory of sediment transport. Channel stability and regime theory.
604. **Agricultural Engineering Problems.** Credit to be arranged not to exceed a total of 5 hours.  
Special advanced engineering and design problems.
605. **Soil Dynamics (5).** Pr., AY 455.  
Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
606. **Agricultural Engineering Management 3 cr.** Pr., 25 cr., in Math.  
Application of the principles of engineering management and economy to the design, development and use of engineering systems in agriculture: Economic evaluations of engineering proposals, inventory theory in the selection and maintenance of agricultural equipment, replacement theory, application of CPM and PERT to scheduling under uncertainty, applications of linear programming, machine reliability, warranties and patents.
608. **Seminar.** Credit to be arranged. All quarters.  
Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
699. **Research and Thesis.** Credit to be arranged.  
May be taken more than one quarter.
799. **Doctoral Research and Dissertation.** Credit to be arranged.

### Agronomy and Soils (AY)

*Professors Ensminger, Adams, Cope, Donnelly, Hiltbold, Hood, Houeland, Rogers, Scarsbrook, and Wear*

*Associate Professors E. Evans and Johnson*

*Assistant Professors Buchanan, Dickens, G. Evans, Hajek, and King*

*Research Lecturers Pearson and Taylor*

201. **Principles of Grain Production (5).** Lec. 4, Lab. 2. Fall, Spring.  
Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.
304. **General Soils (5).** Lec. 4, Lab. 2. Winter, Spring. Pr., CH 105 and 105L or CH 207.  
The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
305. **General Soils (5).** Lec. 4, Lab. 2. Winter. Pr., CH 103-104.  
The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
306. **Soil Morphology and Survey (5).** Lec. 3, Lab. 4. Spring. Pr., AY 304, 305 or 307.  
Physical, mineralogical and chemical properties of soils are studied in relation to their classification for agricultural and engineering uses. Specially designed to fit students for employment as soil surveyors in state and federal agencies.
307. **General Soils (5).** Lec. 4, Lab. 2. Fall, Spring. Pr., CH 103-104.  
The general field of soils including genesis, classification and fertility.
310. **Earth Science (5).**  
Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography; and historical geology. (Not open to students in School of Agriculture. Credit toward degree may not be earned in both this course and a General Soils course.)
401. **Principles of Forage Production (5).** Lec. 4, Lab. 2. Fall, Winter. Pr., junior standing.  
Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
402. **Soil Fertility (5).** Lec. 5. Spring. Pr., AY 304, 305 or 307, and junior standing.  
Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course required of all students majoring in Agronomy and Soils. Either AY 402 or AY 407, but not both, may be used to satisfy the minimum requirement for the Master's degree.
404. **Fiber and Oil Crops (5).** Lec. 5. Winter. Pr., junior standing.  
Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.
405. **Turf and Its Management (3).** Lec. 2, Lab. 2. Fall, odd years. Pr., AY 304, BY 306, BY 309, and junior standing.  
Species of turf crops in relation to latitude, soil type, shading, establishment, fertility, and maintenance.

406. **Commercial Fertilizers (3).** Lec. 3. Winter. Pr., AY 304, 305 or 307, or by special permission of instructor; also junior standing.  
Raw material reserves; manufacture, and properties of fertilizer materials, properties and formulation of mixtures; relative efficiency of various plant nutrient sources; and related agronomic problems.
407. **Soil Management (5).** Lec. 5. Summer. Pr., AY 304, AY 305, or AY 307, and junior standing.  
Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Vocational Agriculture. Either AY 402 or AY 407, but not both, may be used to satisfy the minimum requirement for the Master's degree.
408. **Soil Resources and Conservation (5).** Lec. 4, Lab. 2. Fall. Pr., AY 304, 305 or 307 and junior standing.  
Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
409. **Seed Production (3).** Spring, odd years. Pr., AY 201, or 401 and junior standing.  
Methods and factors affecting production, storage, and processing seed.
410. **Methods of Plant Breeding (5).** Lec. 4, Lab. 2. Fall, even years. Pr., ZY 300 and junior standing.  
A general course in the principles and methods of plant breeding.
411. **Soil Management (3).** Lec. 4. Pr., AY 304, 305 or 307 and graduate standing.  
Classification, physical properties, moisture, organic matter, and pH of soils, and their management with respect to these properties. (Credit for both AY 411 and AY 402, or AY 407 may not be used to meet requirements for the Master's degree.)
412. **Advanced Forage Crops (3).** Lec. 4. Pr., AY 401 and graduate standing.  
Forage species and mixtures, their establishment, maintenance and management for different soils and systems of grazing. (Credit for both AY 412 and AY 403 may not be used to meet requirements for the Master's degree.)
414. **Principles and Use of Herbicides in Crop Production (3).** Lec. 2, Lab. 2. Fall. Pr., CH 104 and junior standing.  
Principles and use of herbicides in agronomic crops. Acquaints the student with methods of application including equipment, time of application, methods of incorporation, and formulation of herbicides. The fate of herbicides in soil and the residual effect on succeeding crops.
455. **Soil Physics (5).** Fall, odd years. Pr., AY 304 and junior standing.  
Lectures and demonstrations to illustrate fundamental physical properties of soils.

## GRADUATE COURSES

601. **Agronomy Problems (1-5).** Credit to be arranged.  
Conferences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
602. **Plant Biological Chemistry (5).** Fall, odd years. Pr., CH 203 or CH 207.  
Biochemical reactions and factors influencing them. Major emphasis is placed on those reactions concerning plants.
606. **Soil Microbiology (5).** Lec. 3, Lab. 4. Spring, odd years. Pr., AY 402 and VM 200.  
Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorous, carbon, and sulfur.
608. **Experimental Methods (5).** Fall, even years.  
Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications; and consists of problems, assigned readings, and lectures.
615. **Seminar in Genetics (1).** Pr., ZY 300.  
Reports by students and staff members on current research and the literature in the field of genetics.
616. **Advanced Plant Breeding (5).** Lec. 4, Lab. 2. Winter, even years. Pr., ZY 300.  
Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
617. **Experimental Evolution (5).** Spring, even years. Pr., ZY 300 and AY 616.  
The factors affecting the evolution of species.
618. **Crop Ecology (5).** Winter, even years. Pr., BY 306, 413, and AY 402.  
Environmental factors influencing the growth of crop plants.
619. **Theories in Forage Crops Management (5).** Lec. 3, Lab. 4. Winter, odd years. Pr., BY 306, 309, and AY 402.  
Principles involved in successful establishment, maintenance and management of crops used for grazing, hay and silage.

620. **Philosophy and Interpretation of Experimental Research (3).** Lec. 4. Pr., graduate standing.  
Systematic study of the principles and methods of experimental research; the utility of experimental designs; and the utilization of statistical and graphical aids in the interpretation of data. Mathematical comparisons of the efficiency of designs and calculations of statistical values are not a part of this course.
653. **Soil Genesis and Classification (5).** Spring, even years. Pr., AY 306.  
Factors and processes which influence soil formation and properties. Weathering of minerals with particular emphasis on clay mineral formation considered in relation to soil classification units. Classification of soils at the family and higher categorical levels presented.
654. **Advanced Soil Fertility (5).** Spring, odd years. Pr., CH 206, AY 402 and 606.  
Composition and properties of soils in relation to the nutrition and growth of plants.
655. **Soil and Plant Analysis (5).** Lec. 2, Lab. 6. Winter, odd years. Pr., CH 206 and AY 402.  
Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
656. **Soil Clay Mineralogy (5).** Lec. 4, Lab. 2. Fall, even years.  
Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
657. **Soil Chemistry (5).** Fall, odd years. Pr., CH 407 and AY 402.  
Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
658. **Advanced Soil Physics (5).** Lec. 2, Lab. 6. Pr., MH 263, PS 205-206, and AY 455.  
Physical properties of soils in relation to plant growth. Emphasis is placed on methods of measuring soil physical properties and the interpretation of these measurements in terms of plant growth.
699. **Research and Thesis.** Credit to be arranged.  
Research and thesis on problems related to crop production, plant breeding, soil fertility and soil chemistry.
799. **Doctoral Research and Dissertation.** Credit to be arranged.

### Animal Science (AH)

*Professors Warren, Anthony, Patterson, and Strength\**  
*Associate Professors Harris, Huffman, Parks, Smith, Squiers, Tucker,*  
*Turney, and Wiggins*  
*Assistant Professor Daron*  
*Instructor Collins*

200. **Introductory Animal Husbandry (5).** Lec. 4, Lab. 2. Fall, Winter, Spring.  
Provides some understanding of the scope and importance of the field. The importance of livestock to agriculture and to the nutrition of people. The role of nutrition, breeding, selection and management in livestock production.
204. **Animal Biochemistry and Nutrition (5).** Fall, Winter, Spring. Pr., CH 104.  
Principles of animal biochemistry and nutrition and the nutritional requirements of farm animals.
301. **Livestock Judging (3).** Lec. 1, Lab. 4. Winter, Spring. Pr., AH 200.  
Theory and practice in the selection of beef cattle, swine, sheep and horses.
302. **Feeds and Feeding (3).** Fall, Spring. Pr., AH 204.  
Principles and practices of balancing and compounding of rations for beef cattle, sheep, and swine.
303. **Livestock Production (5).** Lec. 4, Lab. 2. Winter. Pr., AH 204.  
Efficient practices for selection and management of beef cattle and swine. For students in Agricultural Education, and Agricultural Economics and Rural Sociology. Credit in AH 401 and/or AH 402 excludes credit for AH 303.
304. **Meats (3).** Lec. 2, Lab. 2. Fall.  
Study and practice in slaughtering, cutting, grading, judging, and evaluating carcasses of meat animals.
309. **Live Animal and Carcass Evaluation (3).** Lec. 1, Lab. 4. Spring. Pr., AH 200.  
Classifying and grading market hogs, cattle and sheep with major emphasis on indicators of carcass merit. Carcass grading, yield grading and evaluation.

\*On leave.



310. **Meat and Meat Products (3).** Lec. 2, Lab. 2. Spring. General Elective.  
Theory and practice of processing, preservation, selection and uses of meats. Degree credit may not be earned in both AH 304 and AH 310.
401. **Swine Production (5).** Lec. 4, Lab. 2. Fall, Spring. Pr., AH 200, AH 204, junior standing.  
Practical problems involved in the breeding, feeding, and management of swine for economic production.
402. **Beef Cattle Production (5).** Lec. 4, Lab. 2. Fall, Winter. Pr., AH 200, AH 204, and junior standing.  
Practical phases of breeding, feeding, and management of beef cattle for economic production.
403. **Animal Breeding (5).** Lec. 4, Lab. 3. Winter. Pr., ZY 300 and junior standing.  
Application of genetic principles to the breeding of cattle, sheep, and swine. Studies of different systems of breeding and selection and their related efficiencies for livestock improvement.
406. **Animal Reproduction (5).** Lec. 4, Lab. 2. Fall. Pr., junior standing.  
Anatomy and physiology of the male and female reproductive tract; hormones; estrus and estrus cycle; ovulation, mating, gestation, parturition; lactation; sperm physiology; collection, storage and dilution of semen; artificial insemination; fertility; sterility; pregnancy tests.
407. **Advanced Livestock Judging (3).** Lec. 1, Lab. 4. Fall. Pr., AH 301 and approval of instructor.  
An advanced course in the selection and grading of livestock.
408. **Applied Animal Nutrition (5).** Lec. 4, Lab. 2. Winter. Pr., AH 204 and senior standing.  
Principles of animal nutrition and their application to the production of farm animals, including the study of physiology of nutrition, metabolism of nutrients and recent nutritional developments.
409. **Horse Production (3).** Lec. 2, Lab. 2. Spring.  
The selection, breeding, feeding, management and use of horses in the Southeast.
410. **Meat Technology (3).** Lec. 2, Lab. 2. Winter. Pr., AH 304 or AH 310, and junior standing.  
Meat curing and processing procedures and the biochemical alterations of meat during aging, curing and processing.
411. **Undergraduate Seminar (1).** Pr., senior standing.  
Lectures, discussions and literature reviews by staff, students and guest lecturers.
418. **Biochemistry (5).** Lec. 4, Lab. 3. Fall. Pr., CH 208 and junior standing.  
Classification, structure and chemistry of the major chemical constituents of living matter.
419. **Biochemistry (5).** Lec. 4, Lab. 3. Winter. Pr., AH 418.  
Introduction to metabolism.
450. **Advanced Animal Nutrition and Livestock Feeding (3).** Lec. 4. Pr., graduate standing.  
Principles of nutrition, nutritional requirements, compounding of rations, role of additives in livestock feeds and study of newer research findings.
451. **Breeding and Genetic Improvement of Farm Animals (3).** Lec. 4. Pr., graduate standing.  
A study of basic genetic principles and their application to the breeding of farm animals. Systems of breeding and selection.
452. **Applied Swine Production (3).** Lec. 4. Pr., graduate standing.  
A study of the basic principles of swine production and the application of recent developments.
490. **Special Problems (1-5).** Credit to be arranged. Pr., departmental approval and junior standing. Not open to graduate students.  
Students will work under the direction of a staff member on specific problems.

## GRADUATE COURSES

(Graduate Standing Required)

600. **Meat Science (3).** Lec. 3, Lab. 2. Winter. Pr., AH 410 or equivalent.  
A comprehensive study of the chemical, physical, histological and bacteriological properties of meats.
607. **Comparative Animal Nutrition (3).** Fall. Pr., AH 408.  
Advanced comparative nutritional requirements in beef cattle, sheep, swine and laboratory animals.
608. **Advanced Animal Reproduction (5).** Pr., AH 406, ZY 424.  
Physiology and endocrinology of reproduction.

609. **Advanced Beef Cattle Production (5).**  
Advanced studies relating to the production of beef cattle.
610. **Advanced Swine Production (5).**  
Advanced studies of swine production.
611. **Seminar. Credit to be arranged.**
612. **Genetics of Populations (5). Pr., AH 403.**  
Genetic composition of populations and factors affecting rates of change and conditions of equilibrium.
614. **Minerals (5). Pr., CH 208 and satisfactory courses in animal nutrition.**  
The specific functions of minerals in animal metabolism.
615. **Ruminant Nutrition (5). Pr., ZY 424 and AH 419.**  
Rumen fermentation and the biochemistry of ruminant metabolism.
617. **Microbial Biochemistry (5). Fall. Pr., 5 hours of microbiology and AH 419.**  
The anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities; the use of microorganisms for quantitative assays.
618. **Current Problems and Practices in Livestock Farming (5). Summer.**  
Intensive studies of new research findings and their application to livestock production on Alabama farms. Primarily for Vocational Agriculture Teachers and County Extension Workers.
619. **Experimental Methods (5). Pr., satisfactory courses in statistics.**  
Research methods in the animal sciences including design of experiments, experimental techniques, analysis and interpretation of data, evaluation of research literature and preparation of publications.
620. **Experimental Pathology of Metabolic Diseases (5). Winter, by arrangement. Pr., VM 418, satisfactory courses in histology, biochemistry, physiology and general pathology.**  
A comprehensive study of the structural and functional changes associated with metabolic diseases.
641. **Proteins (5). Pr., AH 419 & CH 407 or approval of instructor.**  
Chemical and physical properties of amino acids and proteins, protein structures, and the relation of protein structure to function.
643. **Enzymes (5). Pr., AH 419 & CH 407 or approval of instructor.**  
The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation.
644. **Metabolism (5). Pr., AH 419. Advanced study of metabolic processes.**
645. **Biochemical Research Techniques (5). Pr., AH 419.**  
To acquaint the advanced graduate student with the modern techniques used in biochemistry.
690. **Special Problems. (1-5 hours. Credit to be arranged.)**  
Conference problems, assigned reading and reports in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) physiology of reproduction, (d) nutritional pathology, (e) animal production, (f) experimental pathology, (g) histochemistry, and (h) meats.
699. **Research and Thesis. Credit to be arranged.**  
Research and thesis may be on technical laboratory problems or on problems directly related to beef cattle, sheep or swine.
799. **Doctoral Research and Dissertation. Credit to be arranged.**

## Architecture (AR)

*Head Professor Millman*

*Professors Schaer and Speer*

*Associate Professors Davis, Doerstling, Latta, and Pfeil*

*Assistant Professors Carter, Kaip, Pickard, Williams, and Jarvis*

*Instructors Menzies, Stanland, Wedin, and Faust*

*Visiting Professors Erat, Schild, and Snow*

- 110-11. **Design Fundamentals (5-5). Lab. 15-15.**  
Techniques and methods in graphic communication, and introduction to design principles.
- 201-2-3. **Architectural Design (5-5-5). Lec. 2-2-2, Lab. 9-9-9. Pr., A student must receive a grade of "C" or higher in AT 105, 110, and 111 to be admitted to AR 201. The School reserves the right to refuse advancement to the student regardless of grades if, in the opinion of the faculty, the student does not exhibit sufficient motivation.**  
Principles of spatial composition and structural organization; approaches to architectural design by the analysis of design determinants—9 hours per week in design laboratory. Two hours per week of discussions and laboratory criticism.

- 301-2-3. **Architectural Design (5-5-5). Lab. 15-15-15. Pr., AR 203. Coreq., BT 220.**  
Admission only upon recommendation of the Committee on Design.  
Analysis and solution of buildings of moderate complexity, with emphasis on domestic, civic, and recreational problems; increased attention to construction and finish details. Research, discussions, drawings, models.
360. **Appreciation of Architecture (3). General elective. Pr., sophomore standing. (Not open to AR and ID students.)**  
Architectural development with particular attention to American and contemporary examples. Illustrated lectures, readings, essays.
- 361-2-3. **History and Theory of Architecture (3-3-3). Pr., AR 203.**  
Cultural institutions of the past and the study of the principles of planning and architectural composition, town planning, and landscape architecture as resulting from these forces and structural knowledge of the time. The Ancient, Medieval, and Oriental cultures. Illustrated lectures, readings, drawings, and reports.
370. **Spaces for Living (3). General elective. Pr., junior standing. (Not open to AR and ID students.)**  
Contemporary concepts of design, spatial organization, materials, furnishings, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, reports.
- 401-2-3. **Architectural Design (5-5-5). Lab. 15-15-15. Pr., AR 303, Coreq., BT 313.**  
Buildings of advanced complexity, with increased emphasis on the relation between space organization and the structural system. Research, discussions, drawings, models.
435. **Art and Architecture Seminar (3). Pr., 4th year standing.**  
Readings, discussions, and projects on the relation of the graphic and plastic arts to architecture.
460. **The Architect and Society (3). Pr., 4th year standing.**  
The social, economic, and political factors which have influenced the contemporary expression of architectural design and practice. Analysis of great works and philosophies which led the way to new approaches in design. Appreciation of aesthetics and function as applied to form. Lectures, outside reading and reports.
- 461-2-3. **History and Theory of Architecture IV-V-VI (3-3-3). Pr., AR 363.**  
Continuation of AR 363. Study of Renaissance, Baroque, Colonial American, and Modern cultures. Illustrated lectures, readings, drawings, and reports.
- 465-6. **Architectural Design (5-5). Lab. 15-15. Pr., AR 403. Admission upon recommendation of the Committee on Design.**  
Analysis and design of buildings of advanced complexity, with emphasis on multi-story commercial and institutional projects; group planning and advanced site study. Research, reports, discussions, drawings, models.
467. **Architectural Design (7). Lab. 21. Pr., AR 466, AR 499.**  
The development of a major design problem under direction of the Committee on Design. Drawings, models, details, and written explanations, oral presentation for jury consideration.
- 471-72. **Professional Practice (3-3). Pr., 5th year standing.**  
Procedures in architectural practice; construction methods, estimation of quantities and costs. Office organization; legal requirements; professional organizations and relations; civic responsibility, professional ethics.
474. **Seminar on current issues on planning (3). Lec. 3.**  
An examination of contemporary problems and concerns in the fields of city and regional planning; economic and social ghettos; the air, water and land environment; the professional planner - constituency relationship.
475. **Seminar in Urban Design (3). Pr., 4th year standing.**  
Directed reading and discussion of contemporary developments in urban planning concepts and solutions. Reports and drawings.
476. **Seminar in Contemporary Concepts (5). Pr., AR 463.**  
Current achievements in world architecture with emphasis on broad movements and emerging patterns. Research, directed reading, reports, and discussion.
477. **Seminar in Historical Problems (5). Pr., AR 463.**  
Open to students who have shown ability, initiative, and industry in developing individual projects. Research, reports, and drawings under supervision on approved topics.
478. **Seminar in Technological Problems (3). Pr., 4th year standing.**  
Current technological advances in the building industry and evaluation of their impact upon architecture.
479. **Seminar in Architectural Literature (2). Pr., 4th year standing.**  
A guided study and discussion of selected readings.
495. **Honors Program. Credit to be arranged up to 5 hrs. Pr., 4th year standing.**  
Admission only by the Committee on Honors Program. Development of an area of concentration through independent study. Scope of work and its evaluation to be determined by the Committee. May be taken more than one quarter.

**499. Design Research (2). Pr., AR 465.**

The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

**601. History and Principles of City and Regional Planning (5). Lec.**

Origins and development of the city; the urban region. The development of planning and its application to the city and the urban region; background of recent reactions and present trends in planning.

**602. Seminar in Planning Theory and Design (5).**

Planning and the scientific method. Cause and effect. Models in planning, introduction to techniques of mathematics, value and goal formulation, and decision theory in planning. Relationships of the planning process to physical design.

**610-11. Seminar Workshop I and II 5-5.**

The comprehensive plan. Examination of the levels of planning in the research in development of a comprehensive community and regional plan through socio-economic studies, physical surveys, analysis, and other techniques of the planning process. (Two-quarter sequence to be taken by all M.R.P. candidates).

### Courses specifically required in the Interior Design curriculum (ID)

**215-16-17. Elements of Interior Design (3-3-3). Lec. 1, Lab. 3. Pr., AR 111.**

The profession of interior design including professional procedures, relationships, ethics, correlation with architecture and other arts. Lectures, readings, discussions and research.

**305-6-7. Interior Design (5-5-5). Lab. 15-15-15. Pr., AR 203. Admission upon recommendation of the Committee on Design.**

Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.

**365-6. Period Interiors (5-5).**

The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.

**367. Contemporary Interiors (3). Lec. 2. Pr., AR 366.**

The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lectures, readings, reports.

**405-6. Interior Design (5-5). Lec. 2-2, Lab. 9-9. Pr., AR 307. Admission upon recommendation of the Committee on Design.**

Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.

**407. Interior Design (7). Lec. 2, Lab. 15. Pr., AR 406.**

The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.

**408. Interior Design Research (2). Lec. 1, Lab. 3. Coreq., AR 406.**

The selection and comprehensive programming of a terminal problem in interior design to be executed in AR 407.

**441. Professional Practice (3). Lec. 1, Lab. 3.**

Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.

### Courses specifically required in the Industrial Design curriculum (IN)

**210. Industrial Design (5). Lec. 1, Lab. 12. Pr., AR 105, 110, and 111. Admission only upon recommendation of the Committee on Design (1.00 overall).**

The problems of visual communication. Perception theory, design fundamentals; color, figure organization, movement and balance, proportion and rhythm.

**211. Industrial Design (5). Lec. 1, Lab. 12. Pr., AR 210.**

An extension of principles encountered in Industrial Design I. A study and analysis of Industrial Design Fundamentals.

**212. Industrial Design (5). Lec. 1, Lab. 12. Pr., AR 211.**

Structural and functional relationship of design elements; convenience, utility, safety, maintenance.

**221. Materials & Technology (5). Lec. 5. Pr., sophomore standing.**

The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.

**222. Technical Illustration (5). Lec. 5. Pr., sophomore standing.**

Axonometric drawing, perspective, and freehand graphics, as used by Industrial Designers.

**223. Industrial Design Methods (5). Lec. 5. Pr., sophomore standing.**

The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.

308. **Design Workshop (3).** Lec. 1, Lab. 2. Pr., AR 210.  
Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.
310. **Industrial Design (5).** Lab. 15. Pr., AR 212, AR 222, AR 223, EG 105. Admission only upon recommendation of Committee on Design. (1.00 overall and 1.33 from AR 210, 211, 212.)  
Design of machines and instruments. Arrangements of elements in systems.
311. **Industrial Design (5).** Lab. 15. Pr., AR 310, PS 204.  
Design of domestic and office equipment.
312. **Industrial Design (5).** Lab. 15. Pr., AR 311.  
Exhibition and packaging problems.
410. **Industrial Design (6).** Lec. 2, Lab. 12. Pr., AR 312.  
Industrialized building. Building components produced by industrial means.
411. **Industrial Design (6).** Lec. 2, Lab. 12. Pr., AR 410. Admission only upon recommendation of committee on design. (1.25 overall and 1.50 from AR 310, 311, 312, 410.)  
Design or re-design of products of advanced complexity.
412. **Industrial Design Thesis (6).** Lec. 2, Lab. 12. Pr., AR 411.  
A project involving all design phases; project of the student's own selection and approved by the Committee on Design. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. The thesis material will be retained by the Department for one year.
415. **History of Industrial Design (5).** Pr., AR 212.  
Design from the first Industrial Revolution to the present, with emphasis on the relation between design and science, art, technology, and the humanities.
485. **Seminar in Industrial Design (5).** Lec. 5. Pr., fourth year standing.  
Development of individual projects. Research, design, reports, on approved topics.

## Art (AT)

*Head Professor Applebee*

*Professors Abney, Sykes, and Williams*

*Associate Professor Kettunen\**

*Assistant Professors Hiery, Hatfield, Hobbs\*, Mims, Olson, Ross, and Taugner*

*Instructors Baggett\*, Fitzpatrick\*, Harper, Markle\*, Mitchell\*, and Walls\**

105. **Drawing I (5).** Lab. 15.  
Representational drawing. Line, light and dark.
106. **Drawing II (5).** Lec. 2, Lab. 9. Pr., AT 105.  
Emphasis on creativity, composition and pictorial organization. Interpretive drawing.
107. **Drawing III (5).** Lab. 15. Pr., AT 105.  
Drawing in various media emphasizing the human figure in form and compositional studies.
113. **Perspective (3).** Lec. 2, Lab. 3. Pr., AT 105.  
Linear perspective. Shadows, Reflections.
181. **Design Fundamentals I (5).** Lec. 2, Lab. 9.  
Plastic elements. Relationship of the arts. Problems in basic design.
182. **Design Fundamentals II (5).** Lab. 15. Pr., AT 105 and 181.  
Relationship of materials and techniques to form. Perception theories. Applied problems.
205. **Figure Drawing I (5).** Lab. 15. Pr., AT 107.  
Drawing from the model in various media with emphasis on proportions, interpretation and expression.
211. **Lettering (5).** Lec. 5. Pr., AT 181.  
Historical development of letters. Anatomy of letters. Spacing. Drill exercises with pen. Fundamental alphabets and compositions of body matter lettered directly.
212. **Graphic Processes (5).** Lec. 5. Pr., sophomore standing.  
Printing processes, photomechanical reproduction, copy-fitting, paper manufacture and usage, related subjects.
215. **Figure Construction (5).** Lec. 3, Lab. 6. Pr., AT 205.  
Lectures deal with form, function and manner of operation of skeletal and muscular parts of the body. Drawing from casts, models, and skeleton.

\*Temporary.

222. **Painting I (5).** Lab. 15. Pr., AT 106 and 181.  
Transparent water color. Study of the medium and of picture structure. Exercises in still life, figure and landscape painting.
224. **Painting II (5).** Lab. 15. Pr., AT 106 and 181.  
Opaque water color. Techniques and properties of the medium. Objective and subjective handlings as a further extension and application of the plastic elements.
227. **Sculpture I (5).** Lab. 15.  
Three dimensional expression. Clay and other media.
305. **Printmaking I (5).** Lab. 15. Pr., Admission only on recommendation of the Committee on Fine Arts.  
Relief print media. Woodcut, linoleum cut and related techniques.
- 307-8. **Figure Drawing II and III (5-5).** Lab. 15-15. Pr., AT 205.  
Drawing from the model in various media, with emphasis on construction, interpretation and expression.
317. **Packaging (5).** Pr., junior standing and AT 211.  
Types of package design and the materials used. New applications to everyday products.
322. **Painting III (5).** Lab. 15. Pr., AT 222.  
Introduction to oil painting. Exploiting of materials and techniques with still life and the figure as a means for aesthetic exploration.
324. **Painting IV (5).** Lab. 15. Pr., AT 224 and 322. Admission only upon recommendation of the Committee on Fine Arts.  
Painting with optional media and subject matter.
327. **Sculpture II (5).** Lab. 15. Pr., AT 227.  
Three-dimensional expression. Emphasis placed on idea, form, and technique.
338. **Art History I (5).** Pr., sophomore standing.  
The chronological development of Western painting and sculpture from pre-historic through modern times as related to the cultural setting. Illustrated lectures.
339. **Art History II (5).** Pr., AT 338.  
An examination of ideas, philosophies common to all periods of art history, and a comparison of periods in terms other than chronological development. Illustrated lectures, readings, drawings, and reports.
342. **Elementary School Art (5).** Lec. 2, Lab. 8. Pr., junior standing.  
Materials and methods for the development of art activities in elementary schools; exercises in expressive drawing, painting, design and simple lettering.
355. **Illustration I (5).** Lab. 15. Pr., AT 215.  
Basic problems in illustration emphasizing both aesthetic and functional aspects. Drawings and designs for line and halftone reproductions.
361. **Fashion I (5).** Lab. 15. Pr., AT 182, and AT 215.  
Drawing the fashion figure, employing basic types of rendering used in fashion advertising.
381. **Visual Design I (5).** Lab. 15. Pr., AT 182, AT 211, and AT 212. Admission only upon recommendation of the Committee on Design.  
Fundamentals of graphic design. Studies of basic type faces. The trademark. Preparation of art copy for reproduction. Applied problems in advertising and editorial layout.
382. **Visual Design II (5).** Lab. 15. Pr., AT 381.  
Italic types. Problems combining copy-fitting with basic illustration. Preparation of color-separation art copy. Creative expression with letter forms. Letterpress and photo-offset production. The poster. Packaging graphics.
383. **Visual Design III (5).** Lab. 15. Pr., AT 382.  
Script lettering. Planned photographic illustration. Creative design as communication. The trade name. Silkscreen production. Research in pertinent art movements. Packaging graphics.
405. **Printmaking II (5).** Lab. 15. Pr., Admission only upon recommendation of the Committee on Fine Arts.  
Intaglio print media. Etching, engraving and related techniques.
406. **Printmaking III (5).** Lab. 15. Pr., Admission only on recommendation of the Committee on Fine Arts.  
Planographic print media. Lithography and experimental techniques.
422. **Painting V (5).** Lab. 15. Pr., AT 324 and junior standing.  
Painting with optional media and subject matter.
423. **Painting VI (5).** Lab. 15. Pr., AT 422 and junior standing.  
Fundamental problems of painting figures. Experimenting with various means of interpreting the figure in both abstract and realistic compositions.
427. **Sculpture III (5).** Lab. 15. Pr., IL 102 and AT 227.  
Three dimensional expression. Metal and metal techniques emphasized.



431. **Contemporary Art (3). General Elective.**  
A survey of modern painting, sculpture and industrial design. Illustrated lectures, readings.
- 432-3. **Seminar in Art Problems (5-5). Pr., senior standing.**  
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research reports, and drawings under supervision on approved topics.
434. **Seminar in Art History Problems (5). Pr., senior standing.**  
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research, reports, and drawings under supervision of approved historical topics.
442. **Art in Education (5). Lec. 3, Lab. 6. Pr., senior standing.**  
Lectures, reading and research concerning principles and objectives of pertinent phases of Art for the purpose of understanding their significance in teaching at all levels. Emphasis is placed upon creativity rather than technical skill in laboratory experimentation.
456. **Illustration II (5). Lab. 15. Pr., AT 355.**  
Sustained problems in illustration emphasizing both subjective and objective treatments.
462. **Fashion II (5). Lab. 15. Pr., AT 361.**  
Problems in advanced rendering for fashion advertising; figured and textured fabrics, furs, and accessories.
463. **Fashion III (5). Lab. 15. Pr., AT 462.**  
Design of clothing in all categories; historic adaptations; wardrobe color coordination; personality styling.
481. **Visual Design IV (5). Lab. 15. Pr., AT 383.**  
Original student alphabet with application. Research in pertinent art movements. The brochure. Newspaper layout. Television project. Three-dimensional display.
482. **Visual Design V (5). Lab. 15. Pr., AT 481.**  
Optional problems in graphic design used to extend or improve student portfolios.
496. **Thesis 15. Pr., senior standing.**  
A terminal Fine Arts project initiated by the student and accompanied by a written analysis and evaluation. Both problems and written matter will be defended orally by the student before a faculty group.
497. **Thesis 15. Pr., senior standing.**  
A terminal Visual Design project initiated by the student and accompanied by a written analysis and evaluation. Both problems and written matter will be defended orally by the student before a faculty group.

#### GRADUATE COURSES

- 605-6-7-8. **Graduate Design (5-5-5-5). Lab. 15-15-15-15.**  
Advanced programs of creative design in the student's elected field.
627. **Advanced Sculpture (5). Lab. 15. Pr., AT 327 and graduate standing.**  
Aspects of sculptural organization; relief and three-dimensional. Emphasis on idea and technical procedure.
- 641-2-3. **Graduate Research in Art Problems I-II-III (5-5-5).**  
Research on approved topics in the student's special field. Conferences and reports.
699. **Research and Thesis. Credit to be arranged. All quarters. Pr., AT 496 or equivalent.**  
A major art problem consisting of a sustained single project or a logical sequence of shorter projects. The candidate will be required to conceive and execute a work or works exhibiting pronounced creative ability and technical proficiency. Upon recommendation of the major professor, a written essay may be required to accompany the project. All drawings, paintings, and models connected with this work will be retained by the Department of Art.

#### Aviation Management (AA)

*Head Professor Pitts*

*Associate Professor Robinson*

*Assistant Professors Decker, Kiteley, and Townsend*

201. **Elementary Aeronautics (5).**  
Aviation and the basic principles of flight. This course is open to students in all divisions of the University who desire a general and practical knowledge of aviation.
202. **Aerospace History (3).**  
Significant events and accomplishments in man's attempts to move through air and space. Emphasis is placed on activities during the twentieth century.
206. **Principles of Private Flight (3). Lec. 2, Lab. 3.**  
General introduction to flight and preparation for the FAA private pilot written examination. Topics of theory of flight, aircraft and engines, regulation, navigation, meteorology, and aircraft operation and performance covered.

207. **Private Pilot Flight Training (1).** Lab. 3. Coreq., AA 206 or instructor's consent. Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate.
303. **Air Navigation I (5).** Lec. 4, Lab. 3. Pr., MH 160. Construction of maps and charts; dead reckoning and pilotage; solution, application and practice of navigation problems.
304. **Meteorology (5).** Lec. 4, Lab. 3. Pr., sophomore standing. Introductory meteorology including a basic understanding of the atmosphere, measurement of meteorological elements and effect of these on the lower atmosphere. Credit may not be earned in both AA 304 and AA 305.
305. **Aviation Meteorology (5).** Lec. 4, Lab. 3. Pr., PS 206. Basic meteorology and its application to aviation to include computation of data and preparation of weather maps. Weather elements as related to operation of aircraft, computation of data; preparation of weather maps.
307. **Flight Navigation (5).** Lec. 4, Lab. 3. Pr., AA 206, AA 305, or instructor's consent. The principles of pilotage, dead reckoning, and radio/electronic methods of navigation and related topics as applied to cross-country flight planning.
308. **Federal Aviation Regulations (3).** Pr., sophomore standing. All regulations concerning airmen, aircraft, air agencies, operation and traffic rules.
309. **Aerospace Legislation (3).** Federal, state and local legislation affecting aviation and space activities.
311. **Propulsion Fundamentals (5).** Pr., PS 206. Principles of operation, major components and important features of typical propulsion systems used in aircraft and missiles. Includes an introduction to propulsion systems used for spacecraft.
312. **Guidance and Control Fundamentals (5).** Pr., PS 206. Basic principles of aircraft and spacecraft guidance and control.
316. **Aircraft Operation and Performance (3).** Lec. 2, Lab. 3. Pr., AA 206, AA 311, or instructor's consent. Principles of aircraft performance and operations, including powerplants, aircraft systems and equipment, and advanced flight maneuvers required for commercial pilots.
317. **Commercial Flight Training I (1).** Lab. 3. Coreq., AA 316 or instructor's consent. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers.
318. **Commercial Flight Training II (1).** Lab. 3. Pr., AA 317. Coreq., AA 307 or instructor's consent. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night, and instrument flying.
319. **Commercial Flight Problems (3).** Lec. 2, Lab. 3. Pr., AA 307 or instructor's consent. Review of principles of flight, aircraft and engine theory and operation, FAA regulations, navigation, meteorology, and aircraft performance and operation as applied to commercial flying with emphasis on preparation for the FAA commercial written examination.
320. **Commercial Flight Training III (1).** Lab. 3. Pr., AA 318. Coreq., AA 319 or instructor's consent. Conclusion of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test.
337. **Air Transportation (5).** Pr., junior standing. Historical development and present status of air transportation facilities; regulation, state and federal; legal characteristics of air transportation industry; problems and services of commercial air transportation.
401. **Aeronautical Seminar I (1).** Pr., junior standing. Special problems and current status of the aircraft and related industries.
402. **Aerospace Vehicle Systems (5).** Pr., PS 206. Design, use and function of typical hydraulic, mechanical and electrical systems used on aircraft and missiles. Includes an introduction to some of the major systems used in space vehicles.
407. **Aircraft Powerplants (5).** Pr., junior standing. Engine nomenclature and types, cycles of operation, lubrication, fuels, carburetion, ignition and starting systems, engine-propeller performance, introduction to jet propulsion.
416. **Airport Management (5).** Pr., junior standing. Principles of management; financing the airport; sources of income; establishment of rates for services rendered; problems of equipment and airport maintenance; accounting procedures; legal responsibilities; merchandising.

417. **Airline Operation (5).** Pr., junior standing and AA 337.  
History of airlines; financial structure and sources of capital of airlines; sales, reservations and space control; dispatching and passenger care; determination of tariffs; personal relations; research; public relations.
419. **Air Traffic Control (5).** Lec. 4, Lab. 3. Pr., junior standing and AA 307.  
All facilities used in controlling air traffic with special emphasis on control center and control tower operation.
421. **Principles of Instrument Flight (3).** Lec. 2, Lab. 3. Pr., AA 319 or instructor's consent.  
Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying and preparation for the FAA instrument pilot written examination.
422. **Instrument Flight Training (1).** Lab. 3. Pr., AA 320 or instructor's consent.  
Flight and flight simulation instructions in the techniques of instrument flying in preparation for the FAA Instrument Pilot Rating.
425. **Aircraft Components (5).** Pr., junior standing.  
Design, installation, use, and function of hydraulic, mechanical, and electrical systems and equipment of aircraft.
427. **Multi-Engine Training (1).** Lab. 3. Pr., a valid Private or Commercial Pilot Certificate.  
Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine—Land.
428. **Principles of Flight Instruction (3).** Pr., AA 320.  
A study of the principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA flight instructor's written examination.
429. **Flight Instructor Training (1).** Lab. 3. Coreq., AA 428 or instructor's consent.  
Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate.

## Biology (BI)

For staff and other biology courses, see sections for Botany and Plant Pathology below and Zoology-Entomology (Page 322).

101. **Principles of Biology (4).** Lec. 4. All quarters.  
Integrated principles of biology beginning with the structure and function of the cell followed by reproduction, heredity, ecology, and evolution. BI 101L must be taken concurrently.
- 101L. **Principles of Biology Laboratory (1).** Lab. 2. All quarters.
102. **Plant Biology (4).** Lec. 4. Pr., BI 101. All quarters.  
The morphology, physiology, relationships, distribution, and importance of plants. BI 102L must be taken concurrently.
- 102L. **Plant Biology Laboratory (1).** Lab. 2. All quarters.
103. **Animal Biology (4).** Lec. 4. Pr., BI 101. All quarters.  
The morphology, physiology, relationships, distribution, and importance of animals. BI 103L must be taken concurrently.
- 103L. **Animal Biology Laboratory (1).** Lab. 2. All quarters.
104. **Biology in Human Affairs (5).** Lec. 5. Pr., BI 101. All quarters.  
Application of biological principles to an understanding of man as an organism and as a member of the ecosystem.

## Botany and Plant Pathology (BY)

*Professors Lyle, Cairns, Curl, N. Davis, Funderburk, Marshall, and Patterson*  
*Alumni Professor D. E. Davis*  
*Associate Professors Carter, Clark, Gudauskas, and Truelove*  
*Assistant Professors T. Davis, Freeman, Goslin, Klepper, and Shands*  
*Instructor Lee*

With few exceptions Principles of Biology, BI 101 and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology above.

- 102. General Botany (5).** Lec. Dem. 5. All quarters. Pr., BY 101.  
Principal natural groups of plants embracing their particular structure, habits, reproduction, and relationships.
- 306. Fundamentals of Plant Physiology (5).** Lec. 3, Lab. 4. Pr., BI 101, CH 203 or 207 or equivalent.  
General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.
- 308. Plants in Action (3).** Lec. 3. Summer. General Elective.  
The botanical characteristics of most categories of plants including their kinship, origin, past and present distribution, and various ways utilized, as timbers, fruits and other foods, fibers, forage, ornamentals, drugs, etc. Local field trips will be made. (Restricted to students who have had no more than 5 hours credit in botany.)
- 309. General Plant Pathology (5).** Lec. 3, Lab. 4. Winter, Spring. Pr., BI 101-2.  
Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.
- 310. Forest Pathology (3).** Lec. 1, Lab. 4. Winter, Spring. Pr., BI 101-2 or equivalent.  
Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.
- 401. Biological Statistics (5).** Lec. 4, Lab. 2. Fall, Spring odd years. Pr., MH 122 or MH 160 and junior standing.  
Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.
- 405. Introductory Mycology (5).** Lec. 2, Lab. 6. Fall. Pr., BI 101-2 or equivalent and junior standing.  
A systematic survey of the fungi with emphasis on morphology.
- 406. Systematic Botany (5).** Lec. 3, Lab. 4. Spring and Summer. Pr., BI 101-2 or equivalent and junior standing.  
Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature will be considered. Field trips will be made.
- 409. Marine Botany (6).** Lec. 5, Lab. 12. Summer. Pr., Ten hours of biology, including introductory botany, or consent of instructor.  
Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session.
- 410. Aquatic Plants (5).** Lec. 3, Lab. 4. Summer. Pr., BI 101-2 or equivalent and junior standing.  
Identification and study of those plants found in or associated with the fresh water features of Alabama. Emphasis will be on plants which have particular relationships to wildlife management or fish culture. Field trips will be taken and a plant collection required.
- 411. Phycology (5).** Lec. 2, Lab. 6. Spring. Pr., BI 101-2 or equivalent and junior standing.  
The identification, growth, reproduction, distribution, evolution and economic importance of the algae. Field trips will be made.
- 412. Advanced Plant Pathology I (5).** Lec. 2, Lab. 6. Spring, odd years. Pr., BY 309 or equivalent and junior standing.  
Techniques and methodology used in the study of plant pathogens, particularly fungi, bacteria, viruses, and nematodes, and the diseases they cause.
- 413. General Plant Ecology (5).** Lec. 3, Lab. 4. Fall and Spring. Pr., BY 306 and junior standing.  
Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made.
- 414. Plant Morphology (5).** Lec. 3, Lab. 4. Spring. Pr., BI 101-2 or equivalent and junior standing.  
Morphology of the principle plant groups concerning their structure, reproduction, and evolutionary relationships.
- 415. Developmental Plant Anatomy (5).** Lec. 3, Lab. 4. Winter. Pr., BI 101-2 or equivalent and junior standing.  
Comparative anatomy of vascular plants with emphasis on structures and developmental relationships.
- 416. Biological Microscopy, Microtechnique, and Photography (5).** Lec. 2, Lab. 6. Pr., permission of instructor.  
Various forms of optical microscopy; micromanipulation; micrometry; drawing with the microscope. Microobservation: whole-mounts; dissociation; sectioning by freezing and embedding techniques. Vital, in-situ, smear, squash, and section staining. Macro- and micro-photography with still, cine, and lapse-time equipment. Photographic illustration for publication and lantern slide presentation.

419. **Principles in Plant Disease Control (3).** Lec. Spring, even years. Pr., BY 309 and junior standing.  
Designed to acquaint the student with such principles of plant disease control as protection, exclusion, eradication, and resistance. The control of important plant pathogens will be considered by each method. Emphasis will be placed on chemical control with antibiotics, fumigants, and fungicides.
420. **Weed Identification and Control (5).** Lec. 3, Lab. 4. Spring. Pr., BI 101-2 or equivalent and junior standing.  
Recognition of the more noxious weeds, their ecology, habit of growth, dissemination and the evaluation of the various methods of control.
430. **Plant Nematology (5).** Lec. 2, Lab. 6. Winter, even years. Pr., BY 309, BI 101 or permission of instructor and junior standing.  
Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant-nematodes nature of pathogenicity; principles and practices of control; recent advances in phytonematology.
460. **Special Problems (1-3).** All quarters. Pr., senior standing and consent of instructor.  
A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy. A student cannot register for more than 3 hours credit.

## GRADUATES ONLY, MAJOR OR MINOR

601. **Biological Statistics II (5).** Lec. 4, Lab. 2. Winter. Pr., BY 401 or equivalent.  
Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
602. **Least Squares Analysis of Experiments (5).** Lec. 4, Lab. 2. Spring, even years. Pr., BY 401 and BY 601 or equivalent.  
Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.
604. **Advanced Plant Physiology I (5).** Lec. 3, Lab. 4. Fall. Pr., BY 306 and 10 hours of organic chemistry.  
Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.
605. **Advanced Plant Physiology II (5).** Lec. 3, Lab. 4. Winter. Pr., BY 604 or equivalent.  
Water relations and mineral nutrition. Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
606. **Advanced Plant Physiology III (5).** Lec. 3, Lab. 4. Spring. Pr., BY 604 or equivalent.  
Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
608. **Advanced Systematic Botany (5).** Lec. 2, Lab. 6. Spring. Pr., BY 406.  
Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
609. **Advanced Mycology (5).** Lec. 2, Lab. 6. Spring, odd years. Pr., 405 and consent of instructor.  
Identification and classification of fungi. Field trips will be made.
611. **Ecology of Soil Fungi (5).** Lec. 2, Lab. 6. Spring, even years. Pr., BY 309, BY 609.  
Quantitative and qualitative consideration of the microbial population of the soil. Relation of physical environment, antagonistic microorganisms, and higher plants on growth and survival of soil fungi. Emphasis will be on methodology for studying soil microflora and plant disease relationships.
612. **Physiology and Biochemistry of Fungi (5).** Lec. 3, Lab. 4. Winter. Pr., 10 hours of microbiology and 5 hours of biochemistry.  
Biochemical activities of fungi as related to their nutrition, growth, reproduction and fermentative abilities.
613. **Experimental Plant Ecology (5).** Lec. 2, Lab. 6. Pr., BY 413. Summer.  
Field course covering the methods of obtaining quantitative data on the structure and composition of plant communities as well as the use of instruments for evaluating the environment.
615. **Morphology of Angiosperms (5).** Summer. Lec. 3, Lab. 4. Pr., BY 414.  
Principles of angiosperm reproduction with emphasis on structure and evolution.
616. **Cytology and Cytogenetics (5).** Lec. 3, Lab. 4. Winter. Pr., ZY 300.  
Cell structure and function with emphasis on cell reproduction and factors contributing to the evolution of organisms.

617. **Phytopathology (5).** Lec. 3, Lab. 4. Winter, odd years. Pr., BY 309 or 310, VM 495.  
To acquaint students with viruses as plant pathogens and the diagnosis and control of diseases caused by them. Laboratory will involve methodology in the transmission, isolation, and characterization of viruses which infect plants.
618. **Clinical Plant Pathology (5).** Lec. and Lab. 8. Summer, even years. Pr., BY 412 or equivalent or consent of instructor.  
Identification, epidemiology, etiology, and control of the major diseases on various kinds of economic plants, to be selected on the basis of current needs of the students. Subject matter to be presented by various specialists within the department.
619. **Advanced Plant Pathology II (5).** Lec. 3, Lab. 4. Summer, odd years. Pr., BY 412 or equivalent with consent of instructor.  
Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
620. **Chemical Weed Control (5).** Lec. 3, Lab. 4. Fall or Summer, odd years. Pr., BY 306, BY 406 or 420.  
Application, mode of action, physiological relationships, recent advances, and special weed problems.
625. **Special Problems. Credit to be arranged.**  
A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching; L. Virology.
635. **Biological Processes (5).** Lec. 5. Summer. Pr., BI 101-2, CH 104, teaching experience and graduate standing.  
Acquaints the secondary school teacher with some of the fundamental life-processes, and illustrates ways in which each of these affects the affairs of man.
636. **Microbiology (5).** Lec. 3, Lab. 4. Summer. Pr., teaching experience.  
Structure and activities of microorganisms, their distribution and cultivation. The algae, fungi, bacteria, and protozoa are considered particularly as they relate to animal and plant disease, food, industrial uses, sanitation, and immunization.
640. **Departmental Forum (1).** Fall, Winter and Spring. Required of all majors, open to all minors.  
Discussions concerning current topics in the various sciences and related fields.
641. **Seminar in Plant Physiology (1).** Fall, Winter, and Spring. May be taken more than once for credit.
650. **Nuclear Science in Agriculture (5).** Lec. 3, Lab. 6. Spring. Pr., graduate standing with research experience.  
Role of nuclear science in agricultural research with training in the use of radioisotopes and familiarization with the possibilities, limitations, and necessary safety precautions.
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Doctoral Research and Dissertation. Credit to be arranged.**

### **Building Technology (BT)**

*Head Professor Brandt  
Professors Marty and Orr  
Associate Professor Darden  
Assistant Professors Faulkner and Hays  
Instructor Fretwell*

101. **Introduction to Building (3).** Lab. 9.  
Survey of the building industry; building procedures; study of plans and details; use of drawing tools; elements of estimating. Lectures, readings, drawings.
102. **Drawing and Projections (3).** Lab. 9.  
Application of geometry to orthographic, isometric, cavalier, cabinet, and perspective projections. Exercises in working drawings.
206. **Materials and Construction (5).** Pr., BT 101.  
Structural and finish materials and assembly systems used in buildings. Lectures, reports, readings, drawings.
220. **Mechanics of Structures (5).** Pr., PS 205, MH 263.  
Principles of mechanics as applied to building construction, graphic statics; resolution of external forces; analysis of trusses; centroids; moments of inertia; friction. Lectures, demonstrations, problems.
- 311-12-13. **Structures I-II-III (3-3-3).** Pr., BT 220.  
Statically determinate structures including beams, columns, trusses, struts, and tension members. Shear and bending moments, torsion, slope and deflection. Problems worked in wood, reinforced concrete, steel and other structural materials. Lectures, research and problems.



- 321. Construction Problems I (5). Lab. 15. Pr., BT 220.**  
Solution of practical problems normally encountered on the construction project. Layouts, earthwork calculations, formwork design, concrete mix design, and materials storage and handling problems. Construction equipment and manpower resource allocation. Demonstrations, research, reports.
- 367-68-69. History of Building I-II-III (3-3-3). Pr., BT 206.**  
An analysis of the development and use of construction methods and materials showing the effects of this development on building form from ancient to contemporary times. Illustrated lectures, readings, reports and drawings.
- 411-12-13. Structures IV-V-VI (3-3-3). Pr., BT 313.**  
Continuation of Structures I-II-III in the field of statically indeterminate structures. Consideration of lateral stability in buildings. Design of foundations. Lecture, research and problems.
- 422. Construction Problems II (5). Lab. 15. Pr., BT 312 and 321.**  
Individual projects relating to current industry practices. Topics such as prefabrication analysis, high-rise construction, lease vs. purchase of equipment, effect of admixtures in concrete, optimum usage of construction equipment, and time and motion analysis. Lectures, research reports, oral presentations.
- 433. Construction Methods and Estimating I (5). Pr., BT 206 and 312.**  
Material quantities, estimating, builder's organization and procedure, job records, builder's liability, labor relations, safety precautions, project management. Preparation of cost analysis and bid from working drawings. Lectures, problems.
- 434. Construction Methods and Estimating II (5). Pr., BT 433.**  
The use of the Critical Path Method (CPM) for scheduling construction projects. Precedence relationships, updating cost control and cash flow, financial forecasts, manpower and equipment allocation, computer applications, job management. Lectures, problems.
- 452-53. Building Equipment I-II (3-3). Pr., PS 206.**  
Description and analysis of heating, air conditioning, water supply, plumbing, electrical wiring, motors, elevators, and illumination as related to buildings. Lectures, demonstrations, readings, problems.
- 490. Building Construction Thesis (7). Lab. 21. Pr., BT 422, 434 and 4th year standing, third quarter. Admission only upon recommendation of the Faculty Thesis Committee.**  
Preparation of detailed cost estimates and construction program of a building, selected with departmental approval; report to include description of building and site, list of quantities of materials, unit prices of materials and labor, detailed cost sheets; bid and contract forms, construction schedule, and methods required. (Candidate will defend thesis orally before staff and guest specialists.)
- 521-22-23. Advanced Structures I-II-III (5-5-5). Pr., BT 413.**  
Theory and practical design of complex and long span structures, both in steel and reinforced concrete. Multiple story buildings, towers, arches, vaults, domes, thin shell systems, foundations. Lectures, research and problems.
- 541. Building Equipment III (2). Lab. 6. Pr., BT 453 and AR 403.**  
A continuation of Building Equipment I and II in selected laboratory problems.

#### GRADUATE COURSES

- 605-6-7. Graduate Research in Building (5-5-5). All quarters.**  
Independent investigation and reports on topics selected by the student with approval of the instructor.
- 621-22-23. Graduate Construction Design (5-5-5). Lab. 15-15-15. All quarters. Pr., BT 523.**  
The analysis and solution of complex problems in construction design, with particular emphasis upon practical and economical application to a selected building. Conferences, working drawings, models.
- 699. Research and Thesis. Credit to be arranged. May be taken more than one quarter.**  
The analysis and solution of an advanced problem in building. The choice, scope and program of study for the problem must be submitted by the candidate for approval of the department staff during the first week of the quarter.

#### Chemical Engineering (CN)

*Professors Wingard and Hsu\**  
*Associate Professors Moore, Hirth, and Vives*  
*Assistant Professor Askew*

- 101. Chemical Engineering Fundamentals I (1). Lab. 3.**  
A work shop in the use of the slide rule, blue print reading, lettering, graphs and graphing, and interconversion of units.

\*One-third Engineering Experiment Station.

200. **Digital Computers (2). Lec. 1, Lab. 3.**  
Workshop on digital computer programming in the area of chemical engineering.
301. **Material and Energy Balances (5). Lec. 5. Pr., MH 264, PS 221.**  
Chemical engineering process calculations with problems relating to stoichiometric principles, material and energy balances, thermophysics, and thermochemistry.
302. **Chemical Engineering Analysis (3). Lec. 3. Pr., MH 362.**  
Application of mathematical principles and techniques to the analysis and solution of typical chemical engineering problems.
322. **Chemical Process Industries (3). Lec. 3. Pr., CH 304.**  
Major inorganic and organic chemical process industries including raw materials, processing methods, and markets.
324. **Momentum Transport I (3). Lec. 3. Coreq., CN 302.**  
Includes conservation equations, momentum transfer in laminar flow, turbulence, dimensional analysis, design calculations for conduits, packed beds, fluidized systems and filtration.
326. **Energy Transport II (5). Lec. 3, Lab. 6. Pr., CN 324.**  
Includes heat conduction, heat transfer in laminar flow, turbulent heat transfer, analogy between heat and momentum transfer, boiling and condensing vapor, design calculations on heat transfer equipment and evaporation, and also laboratory work in Momentum and Energy Transport.
390. **Introduction to Chemical Engineering Thermodynamics I (3). Jr. standing and/or CH 408.**  
First and second laws. Emphasis on real gases and non-ideal systems. P-V-T relations and equations of state, entropy and energy function changes for different processes, methods for evaluation of energy functions, generalized methods based on the corresponding states.
401. **Chemical Engineering Economics (3). Pr., junior standing.**  
The economic factors affecting the design, operations, and economic aspects of industrial chemical processing, including cost estimation and feasibility studies.
402. **Heat Transfer for Metallurgical Engineers (5). Lec. 5. Pr., MH 361, PS 202.**  
Thermal measurements, steady and unsteady state conduction, radiation, furnace design.
423. **Stagewise Processes (4). Lec. 3, Lab. 3. Pr., CN 326.**  
Theory and design methods of stagewise processes to include analytical, graphical and computer-oriented finite difference methods in such processes as extraction, leaching and distillation. Laboratory work in stagewise processes.
424. **Mass Transport III (5). Lec. 3, Lab. 6. Pr., CN 423.**  
Laminar and turbulent mass transfer, gas absorption, humidification and distillation. Laboratory experiments in binary and multi-component batch and continuous distillation.
427. **Extractive Metallurgy (5). Pr., CH 206 and junior standing.**  
The recovery of the most important metals from their ores, refining and correlation of purity with commercial uses. Included will be processes in the fields of hydro-, electro-, and pyrometallurgy along with such subtopics as ore beneficiation, electrolytic equipment, furnaces and pyrometry.
430. **Analog Computation (2). Pr., MH 265, EE 262.**  
The basic principles of analog computer theory and programming applications to chemical engineering. Includes time and amplitude scaling.
432. **Process Dynamics and Control (5). Lec. 3, Lab. 6. Pr., CN 302.**  
Dynamic analysis of chemical processes. Principles of closed loop feedback control theory, stability, root locus, and frequency response. Use of analog computer for process simulation and mathematical modeling.
437. **Process Engineering (4). Lec. 2, Lab. 6. Pr., senior standing and CN 322. Coreq., CN 424.**  
Semi-independent work of individuals and small groups. The subject matter relates to scientific literature, laboratory operations, and pilot plant development and operation. Included are cost analyses, a market study, and the writing of reports, with principles of the latter stressed.
440. **Nuclear Engineering (5). Pr., senior standing in science or engineering and B average except by special permission.**  
Atomic physics and nuclear reactions. Nuclear reactor principles design, and engineering including radiation, shielding, instrumentation, and heat transfer.
450. **Special Topics in Chemical Engineering (Credit to be arranged with a maximum of 10 hours.)**  
Directed reading covering items of chemical engineering theory in depth coupled with individual laboratory work. May be taken more than once.
460. **Introduction to Plastics (3). Lec. 3. Pr., CH 304 or permission of instructor.**  
High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones and rubbers.
470. **Seminar (1). Senior standing.**  
May be taken for credit twice.

475. **Rate Processes in Materials (3).** Lec. 3. Pr., CH 408 or permission of instructor. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
484. **Chemical Engineering Plant Design (4).** Lec. 2, Lab. 6. Pr., CN 437 and senior standing.  
Individuals or small groups design optimum plant, choosing between alternates, selection of equipment, and the calculation of the required sizes, plant layout, cost analyses and the writing of reports. Comprehensive problems usually include heat, materials and economic balances, unit operations and processes, kinetics, and thermodynamics. Some consideration is given to statistics.
490. **Chemical Engineering Thermodynamics (5).** Lec. 5. Pr., CN 390.  
Treatment of non-ideal gaseous and liquid systems. Process steam, liquefaction and refrigeration. Excess entropy and excess free energy in mixing. Chemical reaction equilibrium. Statistical interpretation of entropy and energy functions.
491. **Applied Chemical Kinetics (4).** Lec. 4. Pr., CN 490.  
Rates of reactions of various orders and complex reactions in respect to the design of chemical reactors. Considered also are catalytic reaction mechanisms and transfer of mass and heat affecting reactor design and operations.

#### COURSES PRIMARILY FOR GRADUATE STUDENTS

601. **Transport Phenomena I (5).** Pr., CN 423, CN 424 or equivalent.  
Momentum and energy transport, mechanisms of viscosity and thermal conductivity, velocity and temperature distribution in laminar and turbulent flow, equations of change, interphase transport, macroscopic balances.
602. **Transport Phenomena II (5).** Pr., CN 601.  
A continuation of CN 601.
603. **Transport Phenomena III (5).** Pr., CN 602.  
Mass transport, mechanism of diffusivity, concentration distribution in solids, laminar and turbulent flow, multi-component systems.
604. **Chemical Engineering Thermodynamics I (5).** Pr., CN 490 or equivalent.  
Emphasis on properties of actual gases, energy functions and engineering applications, molecular theory of fluids, complex non-ideal systems.
605. **Chemical Engineering Thermodynamics II (5).** Pr., CN 604.  
Emphasis on physical and chemical equilibria for complex systems statistical treatment of thermodynamic relations, non-equilibrium thermodynamics.
606. **Chemical Engineering Kinetics I (5).** Pr., CN 491 or equivalent.  
Analysis of complex chemical reactions, reaction mechanisms, homogeneous and heterogeneous catalysis, effect of various physical factors, reaction scale-up, industrial reactors.
609. **Petroleum Refining Engineering (5).** Pr., CH 304, CN 424 or equivalent.  
Composition of petroleum, evaluation of oil stocks, refinery processes, design of refinery equipment, corrosion problems, treatment of petroleum products, petrochemicals, economic aspects of petroleum industry.
610. **Advanced Physical Metallurgy (5).** Lec. 4, Lab. 3. Pr., CN 426.  
Heat treatment of ferrous and non-ferrous metals including microscopic studies. Recent developments also are included. This course is open by special permission to seniors who have credit for CN 426.
611. **Advanced Kinetics and Principles of Reactor Design (5).** Pr., CN 605.
612. **Process Dynamics and Control I (5).** CN 432 or equivalent.  
Control responses, applications of Laplace transforms, control system design, frequency response, distributed parameters, linearizing procedure.
613. **Process Dynamics and Control II (5).** Pr., CN 612.  
Analysis of process dynamics stability analysis, optimizing control, data handling, digital computer control.
614. **Heat Transmission I (5).** Pr., graduate standing.  
Dynamics of chemical engineering processes and operations, such as reactors, heat exchangers, flow-storage systems, and diffusional operations. This course deals primarily with the mathematical study of automated systems and some of the aspects of computer control.
615. **Heat Transmission II (5).** Pr., graduate standing.  
Boiling heat transfer, condensing vapor, natural convection, extended surfaces, radiation heat transfer, packed bed, exchanger design analysis.
631. **High Polymer Science and Technology (5).** Pr., CH 304, CN 424 or equivalent.  
Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, rheology of polymers, specific polymers such as fibers, rubbers, coatings, and adhesives, fabrication method.
650. **Special Topics and Chemical Engineering (credit TBA).**  
Special topics covering in depth scientific industries or types of unit processed may be given as directed reading, lectures or a combination of both. Maximum total credit 5 hours.

670. Seminar (1). Pr., graduate standing.  
May be taken from one to five quarters for credit.
699. Research and Thesis. Credit to be arranged.

## Chemistry (CH)

*Head Professor Colburn*

*Professors Baker, Capps, Kosolapoff, Land, Melius, Nichols,  
Price, Saunders, Stevens, and Ward*

*Associate Professors Barksdale, Dinius, Greene, Peterson, and Ziegler  
Assistant Professors Friedman, Mountcastle, Neely, and Teggin*

101. Introductory Chemistry I (2). Lec. 4. Pr., MH 159 or Coreq., MH 160.  
To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.
102. Introductory Chemistry II (2). Lec. 3. Pr., CH 101, Coreq., CH 103L.  
A continuation of the topics described under CH 101.
103. Fundamentals of Chemistry I (4). Lec. 4. Coreq., MH 160, or MH 161, CH 103L.  
Encompasses the subject matter of CH 101 and CH 102 for the superior student with adequate background preparation. Assignment of this course is based upon certain placement criteria and departmental approval is required.
- 103L. General Chemistry Laboratory (1). Lab. 3. Coreq., CH 102 or CH 103.  
The basic laboratory techniques, to experimental measurements, and to the interpretation of data.
104. Fundamentals of Chemistry II (4). Lec. 4. Pr., CH 103 or CH 102, Coreq., CH 104L.  
A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.
- 104L. General Chemistry Laboratory (1). Lab. 3. Pr., CH 103L, Coreq., CH 104.  
A continuation of CH 103L.
105. Fundamentals of Chemistry III (3). Lec. 3. Pr., CH 104, Coreq., CH 105L.  
The chemistry of certain elements. Special emphasis is placed on the principles of ionic equilibria, solubility product, acid-base phenomena and oxidation-reduction processes.
- 105L. General Chemistry Laboratory (2). Lab. 6. Coreq., CH 105.  
Laboratory work in qualitative analysis.
111. General Chemistry (5). Lec. 4, Lab. 3. Pr., Coreq., MH 160, or MH 159, or MH 161. Credit in CH 101, 102 or 103 excludes credit for this course.  
For chemistry majors and others in closely related areas.
112. General Chemistry (5). Lec. 4, Lab. 3. Pr., CH 111 or CH 103. Credit in CH 104 excludes credit for this course.  
Continuation of CH 111.
113. General Chemistry (5). Lec. 3, Lab. 6. Pr., CH 104 or CH 112. Credit in CH 105 and 105L excludes credit for this course.  
Continuation of CH 112. Laboratory work covers qualitative analysis.
201. Descriptive Chemical Science (5). Lec. 5. Pr., MH 159.  
To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
203. Organic Chemistry (5). Pr., CH 104.  
Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
204. Analytical Chemistry (3). Lec. 3. Each quarter. Pr., CH 105 and CH 105L or CH 113.  
Theory and application of gravimetric, volumetric and colorimetric chemical analysis.
- 204L. Analytical Chemistry Laboratory (2). Lab. 8. Each quarter. Pr. or Coreq., CH 204.  
Analytical techniques applied to the analysis of ores and minerals.
205. Analytical Chemistry (5). Lec. 3, Lab. 6. Pr., CH 204.  
Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
207. Organic Chemistry (5). Lec. 4, Lab. 3. Each quarter. Pr., CH 104.  
This course together with CH 208, meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary, Pharmacy and students in other Biological Sciences.

208. **Organic Chemistry (5).** Lec. 3, Lab. 6. Each quarter. Pr., CH 207.  
Continuation of CH 207.
209. **Organic Chemistry (5).** Lec. 5. Pr., CH 208.  
A continuation of CH 208 with emphasis on the study of those organic compounds considered to be the most important to the understanding of biochemistry. (*i.e.*, polyfunctional compounds, carbohydrates, lipids, amino acids, proteins, and heterocyclic compounds).
301. **Biochemistry (5).** Lec. 4, Lab. 3. Pr., CH 208. Credit in CH 418 excludes credit for this course.  
Especially designed for students in Pharmacy.
302. **Biochemistry (4).** Pr., CH 301. Credit in CH 419 excludes credit for this course.  
Continuation of CH 301.
303. **Organic Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 113.  
Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
304. **Organic Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 303.  
Continuation of extension of CH 303.
305. **Organic Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 304.  
Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry.
316. **Physical Chemistry (5).** Pr., MH 159 or MH 160, CH 105 and PS 205.  
A one-quarter course for pre-medicine students.
401. **Chemistry for High School Science Teachers (5).** Lec. 4, Lab. 3. Summer. Pr., teaching experience.
404. **Organic Analysis (Qualitative) (5).** Lec. 3, Lab. 6. Pr., CH 305 or equivalent and junior standing.  
After performing identification tests on known compounds, the student identifies pure organic unknowns, and separates and identifies the compounds of mixtures. Graduate students identify more unknowns than required of undergraduates.
407. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 104 or CH 112; MH 264; PS 202 or 206 or 221; and junior standing.  
A discussion of the more important theories and laws of physical chemistry.
408. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 407, and junior standing.  
Continuation of CH 407.
409. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 408 and junior standing.  
An extension of principles studied in CH 407-8 with special reference to modern theories of the structure of matter.
410. **Intermediate Inorganic Chemistry I (5).** Lec. 5. Pr., CH 408 and junior standing.  
Atomic structures, valence bonding and periodic properties of the elements.
411. **Intermediate Inorganic Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 410 and junior standing.  
Synthesis and purification of typical inorganic compounds.
412. **Chemical Thermodynamics (5).** Pr., CH 408, and junior standing.  
Basic laws governing changes in energy in gases, liquids and solids.
413. **Analytical Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 409, and junior standing.  
Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical and chromatographic techniques.
415. **Polymer Technology (4).** Lec. 3, Lab. 3. Pr., CH 304 or CN 460 and junior standing.  
Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
- 418-19-20. **Biochemistry (5-5-5).** Lec. 4, Lab. 3. Pr., CH 208, and junior standing.  
A standard year-course in the principles of biochemistry.

## GRADUATE COURSES

601. **Selected Topics in Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 401 or its equivalent.  
Modern topics in general chemistry and a short review of organic chemistry.
610. **Advanced Inorganic Chemistry (5).** Pr., CH 410 or equivalent.  
Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure and valence relationships.
611. **Advanced Topics in Inorganic Chemistry (5).** Pr., CH 610 or equivalent.  
A consideration of the relationship of inorganic chemistry to atomic structure in terms of recent theoretical developments.

612. **Inorganic Preparations (5).** Lab. 15. Pr., CH 610 or CH 611.  
The preparation of typical inorganic compounds illustrating special and more advanced techniques.
614. **The Chemistry of Coordination Compounds (5).** Pr., CH 410 or equivalent.  
Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation and methods of determining formation constants.
616. **Inorganic Reaction Mechanisms (5).** Pr., CH 410 or equivalent.  
Factors affecting the rates of inorganic reactions in solution.
620. **Organic Chemistry (5).** Pr., CH 305 or equivalent.  
This one quarter course is designed to bring the new graduate student to the understanding of the terminology of modern organic chemistry with coverage of the principle properties and reactions of organic compounds. Reaction mechanisms and modern experimental methods of structural determination are stressed.
621. **Organic Chemistry (5).** Pr., CH 620 or equivalent.  
Advanced modern organic chemistry.
622. **Quantitative Organic Analysis (5).** Lec. 2, Lab. 6. Pr., CH 621 or equivalent.  
General methods for the quantitative determination of elements and functional groups in organic compounds.
623. **Heterocyclic Compounds (5).** Pr., CH 621 or equivalent.  
Organic compounds containing heterocyclic ring systems.
624. **Element-Organic Compounds (5).** Pr., CH 621 or equivalent.  
Organic chemistry of Groups III, IV and V elements.
625. **Organic Nitrogen Compounds (5).** Pr., CH 621 or equivalent.  
Organic compounds containing nitrogen.
626. **Polymers (5).** Pr., CH 621 or equivalent.  
Polymeric substances and some of their practical applications.
627. **Special Topics in Organic Chemistry (5).** Pr., CH 621 or equivalent.  
A selection of modern topics in organic chemistry.
- 630-31. **Advanced Physical Chemistry (5-5).** Pr., CH 409 and CH 630. Pr., for CH 631.  
Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
632. **Relation Between Structure and Properties of Chemical Substances (5).** Pr., CH 631.  
Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure of compounds and electronic configurations.
633. **Chemical Kinetics (5).** Pr., CH 631.  
The mathematics and characterization of chemically reacting systems include discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
634. **Heterogeneous Equilibria (5).** Pr., CH 631.  
Chemical and physical equilibria in heterogeneous systems.
636. **Statistical Thermodynamics (5).** Pr., CH 631.  
Statistical approach to thermodynamics and chemical equilibrium.
637. **Introduction to Quantum Chemistry (5).** Pr., CH 631.  
Quantum theory as applied to chemical problems.
638. **Molecular Spectroscopy (5).** Pr., CH 631.  
Theory and Application of Optical and Magnetic Resonance Spectroscopy.
640. **Carbohydrates (5).** Pr., CH 418 or its equivalent.  
The chemistry of the mono- and polysaccharides.
641. **Amino Acids and Proteins (5).** Pr., CH 418 or its equivalent.  
Chemistry of the amino acids and proteins.
642. **Lipids (5).** Pr., CH 418 or its equivalent.  
Chemistry of the lipids and their biological significance.
643. **Enzymes (5).** Pr., CH 419 or its equivalent.  
Physical and chemical properties and mechanisms of action of enzymes and their role in metabolic reaction.
644. **Intermediate Metabolism (5).** Pr., CH 419 or its equivalent.  
Metabolism of the carbohydrates, lipids, and amino acids.
645. **Biochemical Research Techniques (5).** Lec. 2, Lab. 6. Pr., CH 420 or its equivalent.  
To acquaint the graduate students in chemistry, biochemistry and the biological sciences with the modern techniques used in biochemistry.



646. **Physical Biochemistry (5).** Pr., CH 305 and CH 409 or their equivalents.  
The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids and enzymes) are studied. The bioenergetics of the important metabolic pathways are also investigated. Emphasis will be on structure of biological compounds and mechanisms of biological reactions.
650. **Analytical Chemistry (5).** Pr., CH 413 or equivalent.  
Analytical principles, applications and methods, mathematical interpretations and current developments.
651. **Analytical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 413.  
Analytical application of chemical spectroscopy.
652. **Theories and Current Topics of Analytical Chemistry (5).** Winter quarter, odd years. Pr., CH 651.
653. **Physio-chemical Separations (5).** Lec. 4, Lab. 3. Spring quarter, even years. Pr., CH 409.
654. **Radiochemical Analysis (5).** Lec. 3, Lab. 6. Summer quarter, odd years. Pr., CH 205.  
The application of radioactive tracers and related techniques to chemical analysis.
670. **Seminar (1).** (Total credit not to exceed 10 hours). Each quarter except Summer.  
Required course for all graduate students in chemistry.
699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.
799. **Doctoral Research and Dissertation.** Credit to be arranged.

### Civil Engineering (CE)

*Head Professor Rainer*

*Professors Bransford, Hudson, and Popovics*

*Associate Professors Blakney, Krishnamurthy, and Metz*

*Assistant Professors Judkins and Peterson*

*Instructor Ramey*

201. **Surveying I (5).** Lec. 3, Lab. 6. Pr., MH 160 or 161 and EG 102 or equivalent.  
Measurement of distances, elevations and angles; analysis of errors; adjustment of instruments; computation of positions, areas and volumes; contours; establishing grades; topographic mapping and land surveying.
203. **Surveying II (4).** Lec. 3, Lab. 3. Pr., CE 201, MH 264.  
Laying out simple curves, compound curves, spirals and vertical curves; astronomic observations; special topics in excavation and embankment.
210. **Engineering Surveying (3).** Lec. 2, Lab. 3. Pr., MH 160 or 161.  
Use of tapes, transits and levels; computation of positions, areas and volumes; grades; mapping; contours. For non-Civil Engineering students.
303. **Structural Materials Testing (3).** Lec. 2, Lab. 3. Pr., ME 208.  
Physical behavior of structural materials. Use of strain gages. Testing of structural members under axial loads and in flexure.
304. **Theory of Structures I (5).** Pr., ME 208.  
Stress analysis of statically determinate structures; reactions, shears, moments, and influence lines. Influence tables.
309. **Water Supply and Disposal Systems (5).** Lec. 4, Lab. 3. Pr., CE 309.  
Theory and design of water collection and distribution facilities and waste-water collection systems. Laboratory includes fundamental tests relating to both water supply and waste-water treatment. Emphasis placed on theory and significance of the tests.
308. **Hydraulics (5).** Lec. 4, Lab. 3. Pr., ME 340.  
Ideal fluid flow, real fluids, fluid resistance; fluid measurement and control; steady pipe flow, steady open channel flow; unsteady flow. Emphasis on steady flow and open channel flow.
314. **Photogeology for Engineers (5).** Lec. 4, Lab. 3. Pr., CH 104, CE 201.  
Photographic materials and nomenclature; petrology; physical geology; use of aerial photography in interpretation of culture, petrology, structural geology, geomorphology and hydrology for resource development.
320. **Highway Engineering I (5).** Pr., CE 203.  
Development of highways; plans and surveys; geometric design; traffic capacity; traffic control; and drainage.
380. **Theory of Structures II (5).** Pr., CE 304, junior standing.  
Stress analysis of statically indeterminate structures. Slope and deflection. Moment area, conjugate structure, consistent deflection, slope deflection, moment distribution. Influence lines.

400. **Higher Surveying (5).** Lec. 4, Lab. 3. Pr., CE 203, junior standing.  
Photogrammetry, map projections, electronic and special instruments, selected geodetic topics.
402. **Statically Indeterminate Structures (5).** Pr., CE 380, senior standing.  
Special topics in moment distribution; continuous and internally indeterminate trusses; beams on elastic supports.
404. **Reinforced Concrete (4).** Pr., CE 380, senior standing.  
Working stress and ultimate strength approaches to the design of beams, slabs and columns; building codes.
405. **Water and Waste-Water Treatment (5).** Lec. 4, Lab. 3. Pr., CE 305, junior standing.  
Theory, design, construction, and operation of water treatment and waste-water disposal facilities considered on a unit operations basis.
407. **Municipal Engineering I (3).** Pr., senior standing.  
Duties and responsibilities of city engineer and municipal consultant; problems connected with promoting, financing, designing, and constructing municipal improvements.
408. **Engineering Foundations (3).** Pr., CE 404, CE 418, CE 314, senior standing.  
Application of geology, soil mechanics, and structural theory to the design of foundations such as footings, piles, pile groups, retaining walls, abutments, and bridge piers. Review reports on current articles in technical publications.
409. **Environmental Health Engineering (5).** Pr., senior standing.  
Application of engineering methodology to communicable disease control, insect and rodent control, milk and food sanitation, institutional and housing hygiene, swimming pool sanitation, rural sanitation, industrial hygiene, refuse collection and disposal, radiological sanitation, and air pollution.
410. **Highway Engineering II (5).** Pr., CE 320.  
Contracts and specifications; supervision of construction; structural design of roadway section; construction procedures and maintenance.
411. **Flow in Open Channels (5).** Lec. 5. Pr., CE 309 or ME 325, junior standing.  
Uniform flow, rapidly varied flow, gradually varied flow, subcritical transitions, surges, supercritical transitions, bends, precipitous slopes, energy dissipation, spillways, and oscillatory waves.
412. **Hydrology (5).** Lec. 5. Pr., CE 309 or ME 325, junior standing.  
Precipitation, runoff, flood routing, flood control, river regulation, and coastal engineering problems.
413. **Hydraulic Structures (5).** Lec. 5. Pr., CE 309 or ME 325, senior standing.  
Dams, spillways, outlet works, gate structures, locks, structures for river regulation, canals, structures for shore protection, port facilities.
414. **Structural Design I (3).** Pr., CE 380, junior standing.  
The structural design of metal and timber members for flexure, shear, tension, compression and combined effects. Design of trusses, frameworks and connections.
415. **Construction Planning (5).** Lec. 4, Lab. 3. Pr., junior standing.  
Construction methods; estimates of materials and costs; critical path scheduling, and reports.
416. **Prestressed Concrete Design (3).** Pr., CE 404, senior standing.  
The principles and practice of prestressed concrete; design of pre- and post-tensioned beams for flexure and diagonal tension. Special topics.
417. **Structural Design II (5).** Lec. 4, Lab. 3. Pr., consent of the instructor and senior standing.  
Design studies in selected topics such as continuous trusses, rigid frames, multistory frames, and arches.
418. **Soil Mechanics (5).** Lec. 4, Lab. 3. Pr., ME 208, junior standing.  
Engineering properties of soils; soil surveys and sampling; stability; laboratory analysis and tests.
419. **Municipal Engineering II (3).** Lec. 2, Lab. 3. Pr., senior standing.  
Engineering problems of municipal transportation, communications, water supply, sewerage, streets, schools, shopping, parking, and recreation facilities.
420. **Sanitary Engineering Laboratory (5).** Lec. 4, Lab. 3. Coreq., CE 405, junior standing.  
Studies in the physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes; interpretation of routine plant control analyses and indices of pollution.
421. **Water Resources Engineering (5).** Lec. 5. Pr., CE 309, senior standing.  
Environmental significance; hydrologic factors; water laws; water uses; nature, sources and abatement of pollution; quantity control measures, planning.
422. **Senior Seminar (1).** Pr., senior standing in Civil Engineering.  
Report on current civil engineering literature; discussion and engineering developments; engineering organizations, publications and activity; special speakers.

423. **Similitude in Engineering (3).** Lec. 2, Lab. 3. Pr., senior standing or consent of instructor.  
Principles of dimensional analysis and similitude, types and uses of models, analogies. Simple applications to engineering problems.
424. **Air Pollution (3).** Pr., senior standing and consent of the instructor.  
The nature of polluting materials including gases, dusts, vapors and fumes and the relation of atmospheric conditions to their dispersal. Administrative standards and controls pertaining to air pollution.

## GRADUATE COURSES

600. **Bituminous and Concrete Mix Design (5).** Lec. 3, Lab. 6. Pr., CE 605.  
Methods of design of bituminous and concrete mixes, with practice in job and laboratory control tests of aggregates and mixes.
601. **Subgrade Stabilization (5).** Lec. 3, Lab. 6. Pr., CE 418.  
Factors involved in stabilization with practice in laboratory and job control tests.
602. **Advanced Soil Mechanics (5).** Lec. 3, Lab. 6. Pr., CE 418.  
Earth pressure theories; stability computations; seepage computations; consolidation; footing, raft, pile and pier foundation; shearing strengths.
603. **Mechanical Properties of Concrete (5).** Lec. 3, Lab. 6. Pr., CE 303.  
Fresh concrete: workability, consistency, composition, unitweight, segregation, bleeding. Hardened concrete: various strengths, deformations under load, time-dependent deformation, etc. Effects on these properties. Test methods. Relations between the composition and mechanical properties of concrete.
610. **Model Analysis of Structures (2).** Lec. 0, Lab. 6. Pr., consent of instructor.  
Structural models, direct and indirect model analysis of structures. Instrumentation for structural testing.
612. **Hydrodynamics (5).** Lec. 5. Pr., CE 309 or ME 325 and MH 361.  
Equations of motion for nonviscous liquids, force potentials, velocity potentials, conformal mapping, circulation, vortices, equations of motion for viscous liquids, boundary layers, drag, turbulence, and wave motion.
613. **Flow of Fluids in Pipes (5).** Pr., CE 309 or ME 325.  
Viscous and turbulent flow of liquids, effects of compressibility, pressure waves, secondary flows, control devices, measuring devices.
620. **Advanced Water and Waste-Water Treatment (5).** Pr., consent of instructor.  
The principles utilized in water and sewage treatment processes and environmental health engineering practice.
621. **Advanced Design of Water Supply and Disposal Systems (5).** Lec. 3, Lab. 6. Pr., consent of instructor.  
Problems in the layout and design of water, sewage, or industrial waste systems and treatment plants.
622. **Advanced Environmental Engineering Practice (5).** Lec. 3, Lab. 6. Pr., consent of instructor.  
Advanced laboratory problems and field exercises in the application of sanitary examination of water, milk, food, wastes, and air; stream pollution and industrial waste surveys.
623. **Industrial Waste Treatment (5).** Pr., consent of instructor.  
Industrial waste problems, including the characteristics of individual industries, effects on streams, and methods of treatment and disposal; treatment and disposal of radioactive wastes.
630. **Advanced Stress Analysis (5).** Lec. 4, Lab. 3. Pr., consent of instructor.  
Buckling of structures, analysis of elastic and plastic stability, torsion, secondary stresses, arches, theory of limit design.
631. **Special Topics in Structural Design (5).** Lec. 4, Lab. 3. Pr., CE 630.  
Analysis of conical shells, shells of a surface of revolution, hyperbolic paraboloid shells, thin plates.
632. **Experimental Stress Analysis (5).** Lec. 3, Lab. 6. Pr., consent of instructor.  
Basic theory and laboratory techniques for experimental stress analysis; measurement of strain by mechanical and electrical gages; brittle lacquer, and photogrid; two dimensional photoelasticity; membrane analogies; treatment of errors. Term paper required, except for undergraduates permitted to enroll in course.
633. **Elasticity (5).** Pr., consent of instructor.  
Plane stress and plane strain; differential equations of equilibrium; equations of compatibility, two-dimensional problems in rectangular and polar coordinates; strain-energy methods; analysis of stress and strain in three dimensions, torsion of circular and non-circular cross-section; bending of prismatical bars; stress evaluation from strain measurements.
634. **Advanced Reinforced Concrete (5).** Lec. 5. Pr., CE 404.  
Effect of shrinkage, plastic flow and deflection on concrete design. Plastic and ultimate strength theories of design. Fundamentals of prestressed concrete.

635. **Numerical Techniques in Structural Analysis (5).** Lec. 5. Pr., consent of instructor.  
Approximate methods of analysis for structural members of variable section; stiffness factors; stability; vibrations; elastic foundations, beam-columns.
636. **Topics in Structural Dynamics (5).** Lec. 5. Pr., consent of instructor.  
Vibration theory. Analytical and numerical methods for computing the dynamic response of structural systems. Blast loads; earthquakes; and wind oscillations. Electronic computation will be used.
637. **Matrix Analysis of Structures (4).** Lec. 3, Lab. 3. Pr., consent of instructor.  
Displacement and force methods of matrix analysis of structures; applications to determinate and indeterminate trusses, beams and frames; lack of fit, yielding of support and temperature effects; special methods such as rank technique; computer solutions.
690. **Seminar.** Credit to be arranged. May be taken more than one quarter.
699. **Thesis.** Credit to be arranged. May be taken more than one quarter.

## Consumer Affairs (CA)

*Associate Professors Douty, Morton, and Spencer*  
*Assistant Professors Lorendo, Terrill, and Weaver*  
*Instructor Elam*

104. **Related Art (5).** Lec. 2, Lab. 6. Each quarter.  
Related elementary art and design. Emphasis is placed on the application of art study to the home.
105. **Fundamentals of Clothing (5).** Lec. 2, Lab. 8. Pr., HE 115.  
Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
113. **Housing for Man (3).**  
Housing, equipment and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, personal, and social conditions which affect the family.
115. **Clothing and Man (3).**  
Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
116. **Art for Everyday Living (3).** Lec. 2, Lab. 2.  
A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of the environment for individual and family living.
205. **Clothing For the Family (3).** Lec. 3. Pr., HE 105 or Approved Substitution For Fashion Merchandising Major.  
Clothing consumption problems with emphasis on the needs of family members at all stages of the life cycle.
225. **Textiles (5).** Lec. 4, Lab. 2. Pr., CH 103.  
Fibers, yarns, fabrics and finishes in their relationship to apparel and household fabrics.
233. **Home Equipment (5).** Lec. 3, Lab. 4. Fall, Winter, Spring.  
Home equipment, with emphasis on selection, use and care.
303. **The House (5).** Lec. 2, Lab. 6. Fall, Winter, Spring.  
Planned to give the student an appreciation of basic plans, both period and modern, from the standpoint of utility, beauty and economy.
305. **Tailoring (3).** Lab. 9. Winter, Summer. Pr., HE 205, junior standing.  
Selection of fabric and tailoring of a suit or coat.
306. **Personal Appearance and Social Interaction (3).** General elective. All quarters.  
Good grooming, its contributing factors and their influence on social and business relations.
310. **Mass Communication in Family and Consumer Services (3).** Lec. 1, Lab. 2 2-hr. labs. Pr., HE 202, HE 233, SP 210.  
Responsibilities and techniques of presenting professional information and materials to the public through radio, television and live performances.
313. **Home Furnishing (5).** Fall, Spring, Summer. Pr., HE 104.  
Home furnishings both from an aesthetic and practical standpoint. This includes the recognition of period furniture and its adaptability to the home of today.
315. **Textiles (5).** Lec. 3, Lab. 4. Fall. Pr., CH 103, 104.  
The principal aim of the course in the development of sound judgment in the selection of textiles for personal and household use.

316. **Fashion Analysis (5).** Pr., HE 205, HE 225.  
Study and analysis of the dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
325. **Fundamentals of Retailing (5).** Winter. Pr., EC 200, junior standing.  
The practices and policies of retail stores.
333. **Lighting Equipment (3).** Lec. 2, Lab. 2. Winter.  
Principles underlying the uses of color and lighting equipment in the home.
335. **Retail Training (8).** Fall. Pr., HE 325.  
Three months practical experience with pay in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.
343. **Interior Home Problems (5).** Fall, Spring.  
Harmonious combinations of present day furnishings, materials, and finishes.
345. **Creative Crafts (1-2-3).** Lab. 9. General elective. Each quarter.  
Design and execution of creative crafts; viz., metal work, leatherwork, ceramics, weaving, fabric decoration.
355. **Consumer Textiles (3).** Lec. 3. General elective. Fall, Winter, Spring.  
Textile fabrics, finishes, and trade practices with special emphasis on consumer problems.
375. **Creative Ceramics (1-3).** Lab. 9. General elective. Winter quarter.  
Working with various clays, building processes, ceramic glazes, and ceramic design.
385. **Creative Weaving (2-3).** Each quarter.  
Weaving design and experience in selecting yarns, setting up a loom and weaving one's own fabric.
395. **Clothing Design (5).** Lec. 2, Lab. 6. Fall, Spring. Pr., HE 104, HE 205, or equivalent.  
Color, line, form, and texture as a basis for designing apparel, with consideration of technological developments, production problems, and fashion movements which influence design decisions.
401. **Extension Organization and Methods (5).** Spring, Summer.  
History, organization, and program planning of extension and educational methods of communication.
405. **Creative Costume Design (5).** Lec. 2, Lab. 9. Spring. Pr., junior standing, HE 395, and two quarters of clothing construction.  
Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories and philosophies and practices of contemporary designers.
413. **Contemporary Housing and Equipment—Travel Course (5 hours—28 days).**  
Course may be repeated for additional credit, not to exceed 10 credit hours (not more than 5 hours graduate credit). Pr., 10 cr. hrs. in equipment, housing, or home management; junior standing; consent of instructor.  
Housing and household equipment in North European countries. Housing: historic and contemporary housing, techniques for meeting population growth, the housing of special groups, community and city planning. Equipment manufacture, distribution, testing, standardization, merchandising, power merchandising and home use. Lectures will be presented at prearranged points. A paper is required on a selected phase of the course.
415. **History of Textiles (5).** Lec. 5. Pr., elementary art and junior standing.  
The development of the textile industry and of fabric design from the earliest times to the present day.
416. **Apparel Quality Evaluation (5).**  
Methods for evaluating quality variations of soft goods as affected by materials, manufacturing processes, markets and resources.
423. **Equipment and Housing Technology (5).** Lec. 2, Lab. 6. Pr., junior standing, MH 107 or equivalent, PS 204 or equivalent, CH 104.  
Application of basic physical principles and the use of testing instruments with electricity and fuel gas equipment.
425. **History of Costume (5).** Lec. 5. Pr., elementary art and junior standing.  
Outstanding historic modes in dress for men and women from early times to the present day.
431. **Man-Environment Relations (2).** Pr., Home Economics core courses.  
The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses HE 113, 115, 116, 117, 119, 257, and 323.
433. **Food Equipment (5).** Lec. 3, Lab. 4. Winter, Summer. Pr., junior standing, PS 204, HE 233.  
Principles underlying the operation and use of food equipment.

435. **Textile Testing (5). Lec. 2, Lab. 6. Winter. Pr., HE 315 or equivalent.**  
Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.
445. **Fashion Merchandising (5). Lec. 5. Pr., HE 325, or consent of instructor.**  
Principles and practices of merchandising in relation to problems of retailing fashion goods. Consideration of the consumer as a major factor in planning merchandise assortments and presentation.
451. **Audio-Visual Education In Home Economics (3). Pr., junior standing.**  
Organization and analysis of illustrative and demonstration materials in the major fields of Home Economics.
453. **The Consumer and The Market (5). Fall, Spring. Pr., junior standing and EC 200 or 201.**  
Consumer problems connected with marketing; type of retail outlets, credit advertising, standardization, labeling, and price policies.
455. **Flat Pattern Designing (5). Pr., junior standing. Lec. 2, Lab. 6. Pr., 8 quarter hours in clothing construction.**  
Commercial methods of pattern making. Developing a foundation pattern from which to design and cut garments. Attention is given to variations from the norm of human body measurements and to the need for further research in designing for various age groups.
473. **Contemporary Home Furnishings (3). Lec. 1, Lab. 4. Pr., HE 313 or 343 or its equivalent.**  
Factors contributing to developments in the current home furnishings industry in design, manufacturing cost, and terminology. A project report is required.
475. **Creative Textile Design (2-3). Lab. 9. Pr., HE 104 or AT 181.**  
An introduction to various techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
483. **Laundry Equipment and Care of Textile Articles (5). Lec. 2, Lab. 6. Pr., junior standing, CH 104, PS 204, HE 225 or equivalent.**  
The physical principles involved in the laundering processes will be applied to include selection, care, and proper use of laundering equipment. The reaction of the textile articles to laundry equipment will be studied. The course is team taught by a professor in household equipment and a professor in clothing and textiles.
493. **The House Utility Core (3). Lec. 2, Lab. 3. Pr., junior standing, 5 hours in equipment.**  
A course that presents home wiring, heating and cooling, the use of water in the home, the physical arrangement, and space allocated to their use. To include kitchen, laundry, and bathroom planning.

#### GRADUATE COURSES

601. **Special Seminars in Home Economics (5).**  
A. Child Development and/or Family Life; B. Clothing and/or Textiles; C. Family Economics, Home Management, Equipment and/or Housing; D. Foods and/or Nutrition.
602. **Seminar (1). Winter and Summer.**  
One quarter required for all graduate students in all departments of Home Economics. May be repeated for a maximum of 3 hours credit.
603. **Home Economics in Higher Education (5).**  
The effects of scientific, technological and social developments on the family and the Home Economics profession as they have implications for higher education in this discipline. Emphasis: current trends in subject matter areas, scope and program development, administration, and instructional resources.
605. **Methods of Research in Home Economics (3).**  
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **Research Studies in Home Economics. Credit to be arranged (2-5). Pr., consent of instructor. May be taken more than one quarter. Not to exceed 5 hours credit toward minimum of 45 for M.S. or 48 for M.H.E. degree.**
632. **Research Techniques in Equipment and Housing (5). Lec. 3, Lab. 6. Pr., HE 423, BY 401 (statistics) or equivalent.**  
A lecture and laboratory course in which problem solving techniques and methods are developed.
633. **Family Housing (5). Lec. 5. Pr., EC 200, HE 303, HE 323.**  
The history and development of American housing; economical, legal and social aspects; present trends.
638. **Advanced Housing (3). Lecture lab. 8-12 for 12 days.**  
A two-week course offered in the summer quarter. A leader of some renown in the field of housing will be secured to lecture and direct laboratory work in space, form, livability, and other physical aspects of housing. Approved for graduate credit for Master of Science programs.



652. **Clothing and Textiles Literature (5).**  
Written material in the field of Clothing and Textiles with special emphasis on current periodicals, pamphlets, and reports of recent research. Required of all candidates for the master's degree in Clothing and Textiles.
653. **Economics of Clothing Consumption (5).** Pr., EC 200, HE 205.  
A critical examination of the literature on Clothing and Textiles economics, modern trends in manufacture and distribution and labor laws and their influence on clothing.
655. **Problems in Home Decoration (5).**  
The undergraduate course, HE 313, is used as a basis for advanced work along the same lines. Problems in valuing choice of materials and arrangements of exteriors as well as interiors of the home are made the topic of minor research.
656. **Comparative Methods of Apparel Production (5).** Lec. 2, Lab. 6, Pr., 8 quarter hours of clothing construction.  
End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
657. **Detergency and Cotton Textiles (5).** Pr., HE 315 or equivalent.  
The chemical relation of detergent, water, bleach, and mechanical action to cotton fibers (cellulose).
658. **Chemical and Physical Analysis of Textiles (5).** Pr., HE 315 or equivalent.  
The theory of A.S.T.M., A.A.T.C.C., and other standardized procedures.
659. **Modern Fibers and Fabrics (5).** Pr., HE 315 or equivalent.  
Textiles as they actually are and an evaluation of the individual properties and characteristics peculiar to all fibers.
667. **Clothing and Behavior (5).** Pr., basic courses in Sociology, Psychology, and consent of the instructor.  
Clothing as a factor in the physical, social and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
699. **Research and Thesis.** Credit to be arranged.  
Required of all students under the Thesis Option in any field.

### Counselor Education (CED)

*Acting Head Professor Pharis*  
*Associate Professor Harlan*  
*Assistant Professors Donnan and Michels*

Prerequisites and corequisites in the Department of Counselor Education are experience in teaching or appropriate fields and employment or definite professional objectives leading to employment in guidance, counseling, counselor education, or pupil personal services. CED 621, or equivalent, is prerequisite or corequisite to advanced study.

#### For Advanced Undergraduates and Graduates

421. **Guidance in the Public Schools (5).** Pr., senior standing.  
Emphasizes understanding guidance relationships in the classroom. Not open to graduate students majoring in guidance and counseling.

#### Primarily for Graduate Students

621. **Principles of Guidance and Student Personnel Work (5).**  
Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work. Prerequisite to all further study in guidance and student personnel work.
622. **Introduction to Rehabilitation Counseling (5).** Pr., CED 628 and Permission of Instructor.  
Counseling process in the rehabilitation setting. Focusing also on the historical development, duties, legal background, ethics and the setting.
624. **Medical and Adjustment Aspects of Disability (5).** Pr., Permission of Instructor.  
Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.
625. **Vocational Appraisal (5).** Pr., PG 415 or equivalent and permission of instructor.  
Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.

627. **Problems in Guidance (5).** Pr., permission of the instructor.  
Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
628. **Counseling Theory and Practice I (5).** Pr. or coreq., CED 621, CED 638; pr., PG 415, 433.  
Presents alternative theoretical strategies of counseling; integrates the concepts of individual analysis and the collection and dissemination of educational and occupational information with those of counseling; prepares the student for further study of the theoretical and practical aspects of counseling.
629. **Counseling Theory and Practice II (5).** Pr., CED 628.  
A continuation of CED 628.
630. **Group Procedures in Counseling (5).** Pr., CED 621.  
The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
632. **Organization and Administration of Guidance Programs (5).** Pr. or coreq., CED 621.  
For administrative and guidance personnel. Primary purpose is to identify the major functions of education, perceive guidance in this perspective and then to study the organization, administration, and evaluation of guidance programs in their educational setting.
633. **Analysis of the Individual (5).** Pr. or coreq., CED 621; pr., PG 415.  
Assists teachers and other guidance personnel in acquiring knowledge, understanding and skill necessary to obtain records and appraise information about the pupil as an individual and as a member of a group.
638. **Information Services in Guidance and Counseling (5).** Pr., or coreq., CED 621; pr., PG 415, 433.  
Helps school counselors develop an understanding of the individual appraisal service and its relationship to counseling; the educational and occupational information service and its relationship to counseling.
646. **Studies in Education (1-3).** Pr., One quarter of graduate study and departmental approval.  
A special problem in administration, supervision, guidance, or higher education using research techniques. (Credit in ED 651 prior to 1960 excludes credit for this course.)
650. **Seminar in Area of Specialization (1-5).** Pr., Permission of instructor.  
Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
651. **Internship in Area of Specialization (1-15).** Pr., Permission of the instructor; may be repeated for a total of not more than 15 credits.  
Provides advanced graduate students with full-time, supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods, designed to provide positive evaluation and analysis of the field experience.
656. **Research and Evaluation in Counseling (5).** Pr., Permission of instructor.  
Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.
659. **Practicum in Area of Specialization.** Credit to be arranged. Pr., Permission of major professor. No more than 10 hours of practicum credit may be earned at the Master's level.  
The practicum provides advanced graduate students with supervised experiences with emphasis on the application of concepts, principles, and skills acquired in previous course work.
699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.
798. **Research and Thesis (5).**
799. **Research and Dissertation.** Credit to be arranged.

### Dairy Science (DH)

*Professors Autrey, Cannon, and Hawkins*  
Associate Professor Rollins  
Assistant Professor McCaskey

101. **Man's Food (3).** Lec. 3. Fall, Winter, Spring.  
Analysis of the world food supply; problems of food availability and distribution; methods of alleviating food shortages; role of the food processor.

200. **Fundamentals of Dairying (5).** Lec. 4, Lab. 3. Fall, Spring. Pr., CH 103.  
General survey of dairying. Feeding, care and management of dairy cattle. Dairy farm equipment and records. Composition and properties of milk. Handling, testing and processing of milk.
314. **Dairy Cattle Judging (3).** Lec. 2, Lab. 3.  
Comprehensive study of the ideal body type and conformation pertaining to the major dairy cattle breeds and to the functional anatomy of the cow. Practical work in comparative dairy cattle judging; conduct of judging contests, oral and written reasons for placings; fitting and exhibiting dairy cattle at fairs and shows.
317. **Dairy Cattle Feeding and Management (5).** Lec. 4, Lab. 3. Pr., DH 200 and AH 204.  
Evaluation of various feeds for growth and milk production; nutritional requirements of dairy animals; application of the principles of nutrition to dairy cattle feeding; calculating rations. Some time devoted to dairy cattle breeding plans, procedures of herd record keeping and management.
401. **Physiology of Lactation (5).** Pr., senior or graduate standing.  
Anatomy and physiology of milk secretion; milk precursors; factors affecting composition of milk.
402. **Artificial Insemination (3).** Lec. 1, Lab. 6. Winter. Pr., DH 200 and junior or senior standing.  
The Artificial Insemination Association; anatomy and physiology of bovine reproduction; practice in collecting, processing and using semen in breeding cows; and study of factors affecting breeding efficiency.
403. **Dairy Farm Practices (5).** Lec. 3, Lab. 6. Spring. Pr., DH 317 and junior standing.  
Practical study of feed production, storage, and feeding problems; analysis of herd records and pedigrees; study of herd management procedures. In this course emphasis is on situations and records existing on dairy farms.
406. **Dairy Cattle Feeding and Management (3).** Pr., AH 204 and DH 200 or DH 317, and graduate standing.  
Bases of modern feeding practices; emphasis on reasons for feeding high quality roughage and high energy feeds. Limited study of dairy herd management problems and practices; milk production, testing and recording; appraisal of artificial breeding as a tool in cattle improvement.
407. **Dairy Chemistry (5).** Lec. 3, Lab. 4. Pr., CH 203 or CH 208 and junior standing.  
Chemistry of milk constituents; interaction of constituents with one another under various conditions; analysis of milk, milk constituents, and milk products.
- 408-9. **Processing Dairy Products (5-5).** Lec. 3, Lab. 6. Winter, Spring. Pr., HF 342.  
Application of processing operations to the processing of dairy products; special processing techniques; quality control of products.
410. **Food Microbiology (5).** Lec. 3, Lab. 4. Spring. Pr., VM 200.  
The relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in foods; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation bacteriology.
411. **Food Plant Sanitation (3).** Lec. 2, Lab. 2. Winter. Pr., junior standing.  
Sanitary regulations of food plants. Principles and procedures of cleaning and sanitizing food handling equipment.
412. **Food Science Seminar (1).** Lec. 1. Pr., senior standing.  
Lectures, discussions, literature reviews by staff, students and guest speakers.

## GRADUATE COURSES

602. **Technical Control of Dairy Products (5).** Pr., consent of instructor.  
Advanced methods of analyses of dairy products and the relation between composition and processing methods.
604. **Market Milk (5).** Pr., DH 410.  
Scientific investigations of current problems and their application to the commercial processing and handling of market milk. Special assigned problems.
605. **Ice Cream Making (5).** Pr., DM 410.  
Scientific investigations of current problems and their application to the commercial manufacture and handling of ice cream. Special assigned problems.
607. **Advanced Dairy Cattle Breeding (5).** Pr., consent of instructor.  
The anatomy and physiology of reproduction in dairy cattle; artificial insemination problems.
608. **Dairy Cattle Nutrition (5).** Pr., consent of instructor.  
Critical review of literature on certain dairy cattle nutrition subjects; planning and executing one or more experimental nutrition problems.

609. **Experimental Methods in Dairy Research (5).** Pr., BY 401 or equivalent. Study of techniques in designing dairy research projects and in analyzing results.
610. **Special Problems in Dairy Science (3-5).** Credit to be arranged.
611. **Seminar (1).** May be taken for more than one quarter.
699. **Research and Thesis.** Credit to be arranged.

## Economics and Geography (EC) (GY)

*Professors Anson, Chastain, Kern, Kinsey, Klontz, Richardson, Ritland*  
*Research Professor Steele*  
*Associate Professors Boston, Street*  
*Assistant Professors Bagwell, Dorman, Icenogle, Stanaland, Whitten*  
*Instructors Blades, Bryan, Burks, Bushey, Carlson, Jackson, Paterson, Robbins*  
*Strain, Whatley, Womack, Woodfin*

### Economics (EC)

200. **Economics I (5).** Pr., MH 161 or equivalent, sophomore standing. Economic principles with emphasis upon the macro-economic aspects of the national economy.
202. **Economics II (5).** Pr., EC 200. A continuation of economic principles with emphasis upon micro-economic aspects of the economy.
206. **Socio-Economic Foundations of Contemporary America (3).** General elective. The social and economic developments which lead to and help toward an understanding of present day American society.
350. **Labor Problems (5).** Pr., EC 202, junior standing. The problems of the industrial workers from the standpoint of the worker, the employer, and society.
360. **Money and Banking (5).** Pr., EC 202 or AS 202, junior standing. Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
402. **American Industries (5).** Pr., EC 200, and junior standing. Selected industries, emphasizing economic factors affecting growth, organization and operation.
444. **Labor Legislation (5).** Pr., EC 350, junior standing. Analysis of background, content, and significance of industrial relations, wage and hour, and selected social security laws.
445. **Industrial Relations.** Pr., EC 200 and junior standing. Analysis of legislation, collective bargaining, union-management cooperation, and economic conditions bearing upon employer-employee relations.
446. **Business Cycles (5).** Pr., EC 202 and junior standing. The causation of economic cycles, their measurement and proposed means of control.
451. **Intermediate Microeconomics (5).** Pr., EC 202, junior standing. The theory of pricing under varying market conditions and distribution of income among the factors of production.
452. **Comparative Economic Systems (5).** Pr., EC 202, junior standing. An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
453. **Economics of Growth and Development (5).** Pr., EC 202 and junior standing. Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
454. **History of Economic Thought (5).** Pr., EC 202, junior standing. The development of economic ideas, principles, and systems of analysis from early times to the present.
456. **Intermediate Macroeconomics (5).** Pr., EC 202 and junior standing. The measurement of national output, and with income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
457. **Economic History of Europe (5).** Pr., junior standing. Economic contributions of the medieval period; mercantilism; laissez-faire; developments in agriculture, industry, transportation, trade, and banking to World War II.
458. **Economic History of the United States (5).** Pr., junior standing. Development of the economic institutions, growth of industries, regional specialization, and relation of government to business enterprise from the Colonial period to the present.

460. **Economic Development of the South (5). Pr., junior standing.**  
The historical approach to the development of industry, transportation, banking, etc., in the South. Emphasis is given to Alabama.
462. **Monetary Theory and Policy (5). Pr., junior standing and EC 360.**  
Advanced monetary and banking policy. Attention given to government fiscal policies and programs.
465. **Public Finance (5). Pr., EC 202, junior standing.**  
Facts and principles of government revenues and disbursements including attention to state and local financial problems.
471. **Foreign Trade (5). EC 202, junior standing.**  
Economic background of foreign trade, various products in foreign trade, balance of trade, financing foreign trade, etc.

## GRADUATE COURSES

600. **The National Income and Capital Accumulation (5). Pr., EC 202 and graduate standing or consent of instructor.**  
Computation of the national income, the uses of income data, interest rates, saving and investment, the monetary and credit system.
601. **Value and Distribution (5). Pr., EC 451 and graduate standing or consent of instructor.**  
Positive content and limitations of the modern theories of value, wages, rents, and profits.
622. **Theory of Wages and Labor Mobility (5). Pr., EC 350 and EC 451 or permission of instructor.**  
Includes advanced study of various theories of wage determination and of theories and empirical studies of labor supply and mobility.
650. **Economic Seminar (1-10). Pr., graduate standing or consent of instructor.**  
For those students engaged in intensive study and analysis of economic problems.
654. **Advanced History of Economic Thought (5). Pr., EC 454 or consent of instructor.**  
The development of economic thought with emphasis upon Classical and Neo-Classical authors and their critics. The contributions of each writer are examined in the economic context from which they emerged and their influence on economic thought and national policy considered.
662. **Seminar in Money and Banking (5). Pr., EC 360 and consent of instructor.**  
Goals, procedures, and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to published research results.
665. **Seminar in Public Finance (5). Pr., EC 360, EC 465, and graduate standing or consent of instructor.**  
Theory and principles of public finance at an advanced level with special emphasis on fiscal policy.
671. **International Economics and Finance (5). Pr., EC 471.**  
Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions. Current problems in international finance.

## Quantitative Methods (EC)

244. **Graphic Methods in Business (3).**  
Presentation and analysis of business data by means of graphs and charts including line, bar, area, and break-even types of charts. Graphic solutions in linear programming.
274. **Business and Economic Statistics I (5). Pr., MH 161 or equivalent and EC 200 or AS 202.**  
Frequency distribution and time series analysis; index numbers; probability; binomial and normal distributions; introduction to statistical inference.
374. **Quality Control (3). Pr., EC 274.**  
Methods of assuring quality through commodity and process control. Economic acceptance plans; control charts, use of correlation and other statistical methods in quality control.
474. **Business and Economic Statistics II (5). Pr., junior standing and EC 274 or equivalent.**  
Probability distributions including the Poisson and "t" distribution; advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
475. **Quantitative Methods of Management (5). Pr., junior standing and EC 274.**  
Quantitative methods in management and their application in production, marketing, and finance.

## GRADUATE COURSES

608. **Business Research (5). Pr., EC 474, and graduate standing or consent of instructor.**  
The theory and practice of research through the mail survey, the personal interview, study of documents and observation. The analysis and presentation of research findings will be stressed.

660. **Econometrics (5). Pr., EC 451, EC 474, EC 446 or EC 465, AS 460.**  
Application of mathematics and statistical methods to problems of economic analysis. Econometric models of the economy as a whole and of individual sectors will be considered.
674. **Business and Economic Statistics III (5). Pr., EC 474, or equivalent.**  
Design of experiments; analysis of variance and covariance; fitting of Gompertz and other growth curves; selected nonparametric statistical methods.
675. **Managerial Statistics (5). Pr., EC 474 or EC 475.**  
Application of classical and Bayesian statistical decision theory in the solution of management problems.

### Geography (GY)

102. **Principles of Geography (5). Not open to juniors or seniors.**  
Man and his work in relation to the Earth as a planet, location, climate, land forms, water bodies, minerals, soils, biota.
103. **Economic Geography (5). Not open to juniors or seniors.**  
An elementary, systematic study of distribution and environmental relations of man's principal economic works. Designed primarily for business administration students.
201. **Weather and Climate (5). Pr., sophomore standing.**  
Weather and climate, their causes and controls. Characteristics and distribution of world climates with their economic and social effects.
301. **Geo-Political Basis of World Powers (3). General elective. Pr., junior standing.**  
The interaction between the natural-physical environment and the international activities of world powers. Emphasis is placed upon the changing geographic and economic patterns in world affairs.
303. **Geography of the Soviet Union (3). General elective. Pr., junior standing.**  
The physical and human geography of the U.S.S.R. and its role in international affairs.
304. **Geography of South America (5). Pr., junior standing.**  
A regional survey of economic and social developments, resources and products.
305. **Geography of North America (5). Pr., junior standing.**  
Human-use regions, resources, social and economic developments will be studied.
306. **Geography of Europe (5). Pr., junior standing.**  
The influences of climate, surface features, and natural resources on the distribution of peoples, their industries and routes of trade. Consideration will be given to each country within its regional setting and to the relationship of Europe to the remainder of the world.
307. **Geography of Asia (5). Pr., junior standing.**  
Climate, topography, and natural resources and their influence upon the distribution of peoples, their industries and commerce.
308. **Geography of Africa (5). Pr., junior standing.**  
The principal regions of Africa with particular emphasis on the areas and countries of greater economic and international importance.
404. **Physical Geography of the World (5). Pr., junior standing.**  
Selected elements of physical geography. Soil, water, minerals, flora and fauna will be studied.
405. **Cultural Geography of the World (5). Pr., junior standing.**  
The influence of physiographic factors in the social, economic and political development of peoples and states.
407. **World Resources and their Utilization (5). Pr., junior standing.**  
The world's principal natural resources are studied primarily from the geographic point of view (location, transportation, topography, water supply, power sources, climate, etc.).
410. **Geography of Alabama (5). Pr., junior standing.**  
The geographic characteristics of the State.

### GRADUATE COURSES

650. **Geography Seminar (5). Pr., graduate standing or consent of instructor.**  
Designed for students engaged in intensive study and analysis of problems in geography.

### Electrical Engineering (EE)

*Head Professor Holmes*

*Professors Carroll, Haeussermann, Honnell, Lowry, Phillips, and Russell*

*Alumni Professor Graf*

*Associate Professors Feaster, Hickman, Nichols, and Slagb*

*Assistant Professors Boland, James, Jones\*, Miller, and Rogers*

*Instructors Carter, Dufree, Golden, Kulas, Nale, Pettus, and Sutherland*

262. **Circuits (3). Coreq., PS 222, MH 265.**  
The first of three courses in electrical sciences; emphasis on circuit analysis.

\*Temporary.



273. **Electronic Devices (3). Pr., EE 262.**  
The second of three courses in electrical sciences; emphasis on electronics.
304. **Electric Circuits (4). Pr., MH 263 and PS 206 or PS 222.**  
Passive and active circuits. Not open to electrical engineering students.
305. **Electronics and Instrumentation (5). Lec. 4, Lab. 3. Pr., EE 304.**  
Instrumentation systems; communications systems. Emphasis on application. Not open to electrical engineering students.
306. **Machinery and Power Transmission (5). Lec. 4, Lab. 3. Pr., EE 304.**  
Electrical machinery; power transmission. Emphasis on application. Not open to electrical engineering students.
322. **Logic and Computing Systems (3). Pr., EE 273.**  
Boolean Algebra and special forms of Boolean expressions; logic, logic elements, and logical design; number systems, codes, and the arithmetic element; computer organization and control; arranged laboratory experimentation.
324. **Digital Systems (3). Pr., EE 322.**  
Models of digital systems; sequential circuits and systems; sequence generators and counters; information storage; analog-to-digital and digital-to-analog conversion. This course includes an arranged special projects laboratory where the students perform creative-type experimentation in the Digital Systems Laboratory.
361. **Network Analysis (5). Lec. 4, Lab. 3. Pr., EE 262.**  
Topological properties of networks; the single-storage element circuit; the phasor and the frequency domain; magnetically coupled circuits; polyphase circuits; two-port networks.
362. **Linear Systems (5). Lec. 4, Lab. 3. Pr., EE 361.**  
Fourier series; Fourier transforms; Laplace transforms; stability; analogous systems.
372. **Electronics I (4). Pr., EE 273, EE 361.**  
Semiconductors; electronic devices; equivalent circuits of active devices.
373. **Electronics II (5). Lec. 4, Lab. 3. Pr., EE 372, EE 362.**  
Amplifiers, oscillators; modulation; feedback.
381. **Electromagnetic Devices (4). Lec. 3, Lab. 3. Pr., EE 273.**  
The third of three courses in electrical sciences; emphasis on electromechanics; laboratory experimentation includes instrumentation, circuits, electronics and electromechanics.
383. **Electromechanical Energy Conversion (4). Lec. 3, Lab. 3. Pr., EE 381, EE 362.**  
Matrix algebra; linear transformations; symmetrical components; the generalized machine; direct current machines; induction machines; synchronous machines; systems of inter-connected machines.
391. **Electromagnetics I (4). Pr., MH 362, PS 222.**  
Scalar and vector fields; the electrostatic field; the magnetostatic field; Maxwell's equations; boundary conditions.
392. **Electromagnetics II (4). Pr., EE 391.**  
Energy and power relations for the electromagnetic field; time varying fields; plane waves; theory and application of guided waves.
393. **Electromagnetics III (5). Lec. 4, Lab. 3. Pr., EE 392.**  
Continuation of guided waves; introduction to radiating systems; coordinated laboratory demonstrations and experiments.
412. **Electrical Properties of Materials (3). Pr., EE 393, PS 320.**  
Studies of the electrical properties of materials with emphasis on semiconductors.
413. **Physical Electronics (3). Pr., EE 412.**  
Physical principles of electrical and electronic devices.
424. **Computer Applications in Electrical Engineering (3). Pr., IE 205, EE 322.**  
Digital computer applications in electrical engineering; digital computation; time sharing; on-line applications; simulation.
425. **Computer Organization (3). Pr., EE 322.**  
A simple stored program computer; data representation and algorithms for operating on data; computer units; the combination of computer components to form a structure; selected computer examples.
445. **Nuclear Instrumentation (3). Pr., EE 373 and junior standing.**  
Electronic systems and devices utilized in nuclear science and technology.
446. **Analog Computers (3). Lec. 2, Lab. 3. Pr., EE 273 and junior standing.**  
Computer programming including time and amplitude scaling; computer solution of linear, non-linear, and partial differential equations; simulation of various types of physical systems.
447. **Magnetic Devices (3). Pr., EE 391, EE 373, and junior standing.**  
Magnetic amplifiers and related magnetic devices employing both extrinsic and intrinsic feedback.

452. **Automatic Feedback Control Systems (5).** Lec. 4, Lab. 3. Pr., EE 362.  
Transfer functions; root locus plots; Nyquist and Bode diagrams; compensation.
454. **Introduction to Modern Control Theory (3).** Pr., EE 452.  
Describing functions; phase plane; sampled-data systems; state space.
455. **Automatic Control Instrumentation (3).** Lec. 2, Lab. 3. Pr., EE 452.  
Sensors and transducers; modulators and demodulators for a-c control systems; power amplifiers; corrective networks; prime movers.
464. **Introductory Network Synthesis (3).** Pr., EE 362 and junior standing.  
Introduction to the synthesis of passive networks, with emphasis on driving point functions.
465. **Advanced Circuit Analysis (3).** Pr., EE 362 and junior standing.  
Matrix analysis of circuits; network parameters; three and four terminal networks; special topics.
471. **Communication Theory (5).** Lec. 4, Lab. 3. Pr., EE 373.  
Topics in communication and electronic systems.
473. **Communication Systems (3).** Pr., EE 471 and junior standing.  
Theoretical topics in modern communication systems.
474. **Solid State Electronics (3).** Lec. 2, Lab. 3. Pr., EE 373, EE 391, and junior standing.  
Applied solid-state physics; selected topics in advanced solid-state devices and circuits; integrated circuits.
483. **Energy Conversion and Distribution (3).** Pr., EE 383 and junior standing.  
Further practical aspects of energy conversion and distribution.
485. **Power Systems Engineering (4).** Lec. 3, Lab. 3. Pr., EE 383.  
Fundamentals of power systems; topics in modern power systems engineering; economic factors in power systems; use of the digital computer in power systems design and analysis.
486. **Direct Energy Conversion (3).** Pr., EE 383, EE 392, ME 301.  
Fundamentals; batteries and fuel cells; thermoelectric devices; thermionic devices; photo-voltaic devices; magnetohydrodynamic power generation.
490. **Seminar.** Credit to be arranged. May be taken more than one quarter.
494. **Electromagnetic Propagation (3).** Pr., EE 393 and junior standing.  
Principles of wave propagation in communication systems; study of propagation modes; introduction to interaction of electromagnetic waves and plasmas.
495. **Microwaves (3).** Pr., EE 392 and junior standing.  
Analysis of distributed systems including waveguides and transmission lines; generation and detection of microwave energy; coordinated laboratory experiments and demonstrations.
496. **Antennas (3).** Pr., EE 393 and junior standing.  
Analysis of radiating systems, to include individual radiators and antenna arrays; impedances in radiating system design; antenna performance measurement techniques; coordinated laboratory experiments and demonstrations.

#### GRADUATE COURSES

601. **Linear Analysis I (5).**  
Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
602. **Linear Analysis II (5).** Pr., EE 601.  
Generalized four terminal networks; network parameters, equivalent circuits, and interconnection of networks. Signal-flow diagrams, stability and transients on transmission lines.
605. **Active Circuits (5).** Pr., consent of instructor.  
The analysis of active-device circuits: negative-resistance circuits and devices, amplifiers, oscillators, modulators, and demodulators.
610. **Power Transmission Systems (5).** Pr., EE 601.  
Power transmission systems operating under both normal and fault conditions; problems of design, protection, relaying, and metering; various types of instabilities; application of digital computers to problems in power transmission.
612. **Advanced Topics in Electromechanical Energy Conversion (5).** Pr., EE 601.  
Dynamic equations of motion of electromechanical systems; the generalized rotating electromechanical energy converter; dynamics of systems; the n-m symmetrical machine.
615. **Advanced Electrical Measurements (5).** Lec. 4, Lab. 3. Pr., EE 601.  
Measurements of circuit parameters, current, voltage, power, frequency, and wave shape at all frequencies; capabilities and limitations of contemporary measuring equipment.
617. **Principles of Pulse Circuits (5).** Pr., EE 601.  
Analysis and design of basic types of pulse forming circuits, with applications to pulse systems and laboratory work suited to the individual student's needs.

620. **Nondeterministic Systems Analysis (3). Pr., consent of instructor.**  
Applications of probability, random variables, and stochastic processes in Electrical Engineering.
621. **Electronic Computer Theory (5). Lec. 4, Lab. 3. Pr., EE 601.**  
General study of computer components; operational amplifiers, function generators, multipliers, stabilized power supplies; pulse circuits, memory storage devices and read-out devices; techniques of computer operation.
630. **Electromagnetism (5). Pr., consent of instructor.**  
Theory and application of electromagnetism for students not specializing in electromagnetics.
633. **Nonlinear Analysis (5). Pr., EE 601.**  
Detailed study of systems of nonlinear differential equations with illustrative examples drawn from models representing technological devices based on nonlinear effects.
637. **Plasma Dynamics (5). Pr., EE 630.**  
A study of the dynamic properties of systems of charged particles, with emphasis on systems constrained by steady or time-varying magnetic fields. Areas emphasized are basic theory, laboratory models, and instrumentation.
639. **Switching Theory I (5). Pr., EE 601.**  
Number systems, binary coding, Boolean algebra, combinational switching circuits; multiple output combinational circuits, and bilateral switching networks.
640. **Switching Theory II (5). Pr., EE 639.**  
Models and elementary properties of sequential machines; sequential machine compatibility; equivalence, and state minimization; state assignment for sequential machines; asynchronous switching networks; and, speed independent switching circuit theory.
641. **Digital Systems (5). Pr., EE 639.**  
Memories and the associated read and write circuitry; arithmetical units; analog-to-digital converters; digital-to-analog converters; and special purpose digital units.
642. **Advanced Topics in Switching and Automata Theory (5). Pr., EE 639.**  
Current topics in the field of digital systems. This course will include a complete study of current issues of journals concerned with the design of digital systems.
645. **Network Synthesis I (5). Pr., EE 601.**  
Two-terminal passive networks; properties, realizability, and principles of synthesis. Conventional and modern filter synthesis.
646. **Network Synthesis II. Pr., EE 645.**  
Four-terminal passive networks; properties, realizability and principles of synthesis. Potential analogy and approximation problems.
- 650-1-2. **Electromagnetic Theory and Applications I-II-III (5-5-5). Pr., consent of instructor.**  
A three-course sequence for students specializing in electromagnetics.
653. **Antennas (5). Pr., consent of instructor.**  
Advanced treatment of radiating systems.
- 660-1-2. **Quantum and Parametric Electronics I-II-III (5-5-5). Pr., consent of instructor.**  
Atomic phenomena, quantum theory, kinetic theory and statistical mechanics; applications to electronic devices and systems.
- 670-1. **Information Theory I-II (5-5). Pr., EE 601.**  
Probability; random variables; and stochastic processes. Analysis of channel models and proofs of coding theorems; construction of error-correcting codes; statistical properties of information sources.
- 675-6. **Communication Theory I-II (5-5). Pr., EE 670.**  
Signal detection and selection; modulation and coding; demodulation and decoding; contemporary topics in communication theory.
680. **Directed Reading in Electrical Engineering. Credit to be arranged.**
- 681-2-3. **Automatic Control Theory I-II-III (3-3-3). Pr., consent of instructor.**  
Advanced analysis and design of control systems, including modern and classical control theory as applied to linear, nonlinear, continuous, and discrete systems.
690. **Seminar. Credit to be arranged. May be taken more than one quarter.**
- 691-2-3. **Advanced Automatic Control Theory I-II-III (3-3-3). Pr., consent of instructor.**  
Optimal control theory for deterministic and non-deterministic systems; optimal linear filter theory; modern stability theory.
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Research and Dissertation. Credit to be arranged. May be taken more than one quarter.**

## Elementary Education (EED)

*Head Professor Coss*

*Professors Ellis and Newell*

*Associate Professors Roughton and Sartin*

*Assistant Professors English, Jensen, Wilder, and Wright*

*Instructors Browning, Duncan\*, Justice\*, and Willard*

### Orientation

**102. Orientation (1).**

Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.

**103. Orientation (1).**

Helps freshmen in planning their professional careers.

**104. Introduction to Laboratory Experiences (1).**

Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

### Reading Improvement

Available as a service course and as a general elective to all University students.

**310. Reading Improvement (3). Lec. 2, Lab. 2. General elective. (Not open to students with credit in PG 101.)**

Developmental reading for students who wish to improve their reading skills. Each student's present degree of reading efficiency is diagnosed and a program structured to his individual needs is planned and conducted.

## Curriculum and Teaching

### Undergraduate

**300A. Elementary Curriculum I; Reading and Other Language Arts; Creative Expression (10). Coreq., FED 214. Lec. 8, Lab. 6.**

Skills, techniques, and materials in the language arts curriculum, and the musical and rhythmic activity program in the content of laboratory experiences with children.

**300B. Elementary Curriculum I; Reading and Other Language Arts (6). Lec. 5, Lab. 3.**

For students who have completed the creative expression portion of this course at another institution.

**300C. Elementary Curriculum I; Creative Expression (4). Lec. 3, Lab. 3.**

For students who have completed the language arts portion of this course at another institution.

**396. Music for the Elementary Teacher (3). Pr., MU 371 or consent of department chairman.**

Elective course for Elementary Education Majors who need additional instruction in music.

**400A. Elementary Curriculum II; Mathematics, Natural and Social Sciences (10). Coreq., FED 320. Lec. 8, Lab. 6.**

Developing understandings, skills, and attitudes in the elementary mathematics and science (natural and social) curriculum with emphasis on laboratory experiences and the use and construction of learning materials.

**400B. Elementary Curriculum II; Mathematics (4). Lec. 3, Lab. 3.**

For those students who have completed the natural and social science portion of this course at another institution.

**400C. Elementary Curriculum II; Natural and Social Science (6). Lec. 5, Lab. 3.**

For those students who have completed the mathematics portion of this course at another institution.

Undergraduate students in elementary education are eligible to complete requirements for teaching in certain areas in both the elementary and secondary schools. Students with this interest will complete one course in Teaching and one course in Program and a subject-matter concentration of 27 to 30 quarter hours in the subject-matter field selected. Teaching fields for the twelve-grade program include health, physical education and recreation, page 251, industrial arts, page 318, and the areas

\*Temporary.

listed under Interdepartmental, page 266. (For description of student teaching requirements, see page 266.) Available courses for meeting the subject-matter concentration are listed under minor requirements for each field included in the twelve-grade program.

425. **Professional Internship in Elementary School (15).** Pr., Sr. standing, Admission to Teacher Education three quarters prior to Internship, appropriate professional courses.

(For description, see Professional Internship in School of Education Section.)

450. **Analysis of Elementary Instructional Strategies (3).** Pr., Professional Internship. Lec. 2, Lab. 2.

Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of system's approach in student's area of specialization.

#### Advanced Undergraduate and Graduate

461. **Current Theory and Practice in the Teaching of Reading (5).** Pr., junior standing and teaching experience or consent of instructor.

Principles of reading instruction within the settings of the areas of child development, learning theories, individual differences, the role of reading in the total school and community environment, and examination of current reading materials.

474. **Problems in Improvement of Reading at the Elementary School Level (5).** Pr., junior standing and teaching experience or consent of instructor.

An examination of problem areas of effective reading instruction in grades one through nine. Emphasis on phonetic word attack skills, comprehension, vocabulary building, and the use of supplementary materials in the reading program.

496. **Music in the Elementary School (5).** Pr., junior standing.

To give the individual teacher a deeper insight into skills, techniques, and knowledge of music. Appropriate materials, adapted to social and musical interests of children, are studied and evaluated.

497. **Organization of Elementary School Music (3).** Pr., junior standing and EED 300C or IED 423.

Theory and development of the music program in the elementary school.

#### Graduate

641. **Diagnostic Procedures in Reading (5).** Pr., EED 461 or consent of department chairman.

Administration, scoring and interpretation of specific reading tests to determine causes of reading disability. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis and implication for correction of reading difficulties.

642. **Remedial Procedures in Reading (5).** Lec. 3, Lab. 4. Pr., EED 641 or consent of department chairman.

Appropriate individual and group techniques for correcting deficiencies and practice in continuing evaluation of reading difficulties. Use of equipment and materials with children having reading problems.

646. **Studies in Education (1-3).** Pr., one quarter of graduate study.

A research problem will be selected in consultation with the professor who will supervise it. The problem should contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)

649. **The Elementary School Program (5).**

Major curriculum areas and teaching practices in the modern elementary school. Attention given to implications of research and theory for the total elementary school program.

650. **Seminar in Elementary Education. 3-10 hours.** (Credit not to exceed 10 hours).

Critical analysis and evaluation in elementary education with emphasis on improving the instructional program. An opportunity to do intensive study on selected topics.

656. **Directed Individual Study in Reading Diagnosis and Reading Remediation (5).** Pr., EED 642 or consent of departmental chairman.

Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.

#### Curriculum and Teaching in the Respective Areas of the Elementary School Program

Each of these courses 651, 652, 653, and 654 applies to the following areas of the elementary school program: (G) Language Arts, (H) Mathematics, (K) Science, and (L) Social Science.

651. **Research Studies in Education in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **Curriculum and Teaching in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **Organization of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **Evaluation of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
- Study in other teaching areas including art; dramatic arts; gifted; mental retardation; music; speech, speech correction; health, physical education and recreation; and industrial arts is available also to students in elementary education.
- 659-660. **Practicum in Areas of Specialization (5-5).** Permission of major professor.  
Provides advanced graduate students with supervised experience with emphasis on the application of concepts, principles, and skills acquired in previous course work.

For advanced courses in curriculum, school library science, higher education, and research and dissertation, see IED.

### Thesis

699. **Thesis Research.** (Credit to be arranged.) May be taken more than one quarter.

## Engineering Graphics (EG)

*Head Professor Francis*

*Associate Professors Ingram, Little, McClung, and Thornton*

*Assistant Professors Clement and Klepinger*

*Instructors Bilbe and Stewart*

102. **Engineering Drawing I (2).** Lab. 6. Pr., Plane Geometry.  
Use of instruments; lettering practice; geometric constructions: principle views in projection; auxiliary and section views; dimensioning; detail working drawings; and isometric projection.
104. **Descriptive Geometry (2).** Lab. 6. Pr., EG 102 and Solid Geometry.  
Basic principles pertaining to points, lines, and planes; including problems on sections, developments, and intersections of solids.
105. **Engineering Drawing II (2).** Lab. 6. Pr., EG 102.  
Technical sketching; reading analysis of shop drawings; machine parts, detail and assembly drawings; types and arrangement of materials; titles and symbols; tracings, printing, and other reproduction methods; steel and timber structures; riveting and welding.
106. **Graphical Methods (2).** Lab. 6. Pr., EG 102 or one credit of Mechanical Drawing in an accredited high school.  
Technical sketching, slide rule, statistics and graphical analysis, digital and analog computers and vectors. This course is designed to present the fundamental graphical concepts and related materials as they apply to modern technology and engineering.
204. **Kinematics of Machines (3).** Lec. 2, Lab. 3. Pr., EG 104, EG 105, and coreq., PS 201. Spring quarter.  
Graphical analysis of the fundamental elements of machines, including: definitions, velocity and acceleration diagrams, methods of transmission of motion by links, cams, gears, gear trains, and flexible connectors.
205. **Applied Graphic Statics (2).** Lec. 1, Lab. 3. Pr., EG 105 and coreq., PS 201.  
Resultants and equilibrium of concurrent, parallel and non-parallel forces; moments of parallel forces; general cases of reaction of coplanar forces; stresses in simple trusses by joint and section methods; cranes, derricks, dredges, and frames with bending members; static forces in machines with and without friction.
206. **Technical Sketching (2).** Lab. 6. Pr., EG 104 and EG 105.  
Technical lettering, block and architectural; types of illustrations, purpose and use; sketching techniques; pictorial drawings, oblique, isometric, dimetric, trimetric; perspective; shading; use of the airbrush; charts; reproductions of drawings.



306. **Advanced Graphics for Engineers (3).** Lec. 2, Lab. 3. Pr., EG 104, MH 361.  
Vector geometry, functional scales, nomography, combination of observations, empirical equations, and graphical calculus.

## GRADUATE COURSES

612. **Design of Jigs and Fixtures (5).** Lec. 3, Lab. 6. Spring.  
Accepted types of jigs, fixtures and dies; production rates, expense and savings, automatic tooling design, indexing operations.
620. **Patents (5).** Winter.  
Patentability, claims, patent office procedures, foreign patents, role of patent attorney, patent drawings, sale and exploitation of patents.

## English (EH)

## Head Professor Patrick

*Professors Amacher, Benson, Breyer, Brittin, Burnett, Current-Garcia,  
Haines, Jones, Nist, and Woodall*

*Associate Professors W. S. Allen, Durant, Hudson, Littleton, Michael, and Wright*

*Assistant Professors Butler, Faulk, Logue, McLeod, Melzer, Monteser, Mowat,  
Patterson, Rose, and Stroud*

*Instructors J. W. Allen, Bekus, Brown, J. Feagin, G. Gosser\*, Jacobs, Kidd,  
J. P. Lambert, Lehmann, Martin, Moore, Nordan, Roden, Schneider,  
J. P. Waters, and Weissinger\**

The requirements for the English major enrolled in the School of Arts and Sciences are stated on page 96, and for the English major enrolled in the School of Education, on page 126.

**English Composition (101-2-3 or 105-6)** is required of all students and is a prerequisite for all other courses in English.

- 101-2-3. **English Composition (3-3-3).** EH 101, pr. for EH 102; EH 102 pr. for EH 103.  
All quarters.

The essentials of composition and rhetoric. Reading of selected fiction, poems, and plays.

- 105-6. **Honors Freshman English (3-3).** EH 105 pr. for EH 106. All quarters.  
Reading and composition for superior students. Students earning a C or better final grade in both courses will receive 9 hours of credit. The student falling under a C grade changes to the regular sequence (101-2-3) and completes a total of three courses. (Departmental approval required for admission to this sequence.)

108. **Classical Literature (5).** All quarters.  
The reading and discussion of significant works of classical Greek and Roman literature with emphasis on the western heritage of ancient thought.

141. **Medical Vocabulary (3).** All quarters.  
Prefixes, suffixes, and the more common root words of medical terminology.

208. **Literature of the Western World (3).** General elective. Pr., EH 108 or EH 253.  
All quarters.

Eight significant literary works of the Western World which provide representative views of man in the Medieval, Renaissance-Reformation, and Eighteenth Century periods.

- 253-4-5. **Survey of English Literature (3-3-3).** EH 253 pr. for 254; EH 253-4 pr. for EH 255. All quarters.

English literature from Beowulf to the present.

301. **Creative Writing (3).** General elective. Fall, Spring.  
The writing and criticizing of short stories. But the student may be permitted to write poetry, drama, or any other form of imaginative literature.

302. **Creative Writing (3).** General elective. Fall, Spring.  
A continuation of English 301.

304. **Technical Writing (3).** All quarters.  
Not open to students with credit in EH 345. Report writing for engineers.

310. **Word Study (3).** General elective. Fall, Spring.  
The history of English words and their meanings with the object of improving the student's command of his language and illustrating for him some of the patterns in the development of human thought.

312. **The European Novel (5).** Spring.  
The reading and analysis of significant novels by major European writers.

\*Temporary.

320. **An Introduction to Drama (3). General elective. Winter.**  
Representative tragedies and comedies of Europe from antiquity to the present. Such figures as Sophocles, Moliere, Shakespeare and Ibsen will be considered.
325. **The Short Story (5). Winter.**  
The development of the short story in America and Europe from the early nineteenth century to the present.
330. **Medieval Literature in Translation (5). Spring.**  
Masterworks of English and European literature produced from 1250 to 1400.
340. **The Classical Background (5). Fall. Not open to students with credit in EH 108.**  
Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.
345. **Business and Professional Writing (5). All quarters.**  
Practical composition including abstracting, correspondence, and reports for students in business.  
**NOT OPEN TO ENGLISH MAJORS OR MINORS.** Students cannot earn credit in this course and also in EH 304.
350. **Shakespeare's Greatest Plays (3). General elective. Fall. Not open to students with credit in EH 451-2.**  
Some of Shakespeare's masterpieces.
352. **Contemporary Fiction (5). Fall.**  
American and British novelists from Lawrence to Faulkner.
353. **Contemporary Drama (5). Spring.**  
Continental, British, and American dramatics from Ibsen to the present day.
357. **Survey of American Literature (5). Fall.**  
American literature from the beginning to 1860.
358. **Survey of American Literature (5). Spring.**  
American literature from 1860 to the present.
360. **Continental Fiction (3). General elective. Winter.**  
Representative European short stories and novels.
361. **History of English Drama (5). Winter.**  
English drama from the medieval period to 1900.
363. **Eighteenth Century English Literature (5). Fall.**  
Poetry and prose from Dryden through Shenstone.
365. **Southern Literature (3). General elective. Spring.**
372. **The American Novel (5). Winter.**  
The development of the American novel from the beginning to 1900.
381. **The Literature of the Age of Reason (3). General elective. Fall.**  
Rationalism, its assumptions and effects, political, social, and scientific as seen in the works of such major eighteenth-century writers as Locke, Johnson, Burke, Voltaire, and Rousseau.
390. **Advanced Composition (5). All quarters.**  
The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.
394. **Introduction to Linguistics (5). Winter.**  
The phonological, morphological, and syntactical systems of late modern English.
401. **Advanced English Grammar (5). Fall, Spring. Pr., junior standing.**  
Formal and functional grammar.
410. **European Literature (5). Winter. Pr., junior standing.**  
The principal European literary figures and trends from the Renaissance to the present, with emphasis on the literature of Italy, France and Germany.
415. **Great Nineteenth Century Writers (3 hrs.).**  
Selected works of five to eight important Nineteenth Century writers such as Balzac, Flaubert, Chekhov, Turgenev, James and Zola.
420. **Great Twentieth Century Writers (3 hrs.).**  
Selected works by five to eight important Twentieth Century authors such as Conrad, Shaw, Faulkner, O'Neill, Joyce, Kafka, and Sartre.
425. **Comedy and Satire (5). Pr., junior standing.**  
The theory and appreciation of two closely interrelated literary genres, based on the reading of representative examples from the literature of the Western World.
430. **The Craft of Fiction (5). Pr., junior standing, EH 301-2, consent of instructor. Winter.**  
The writing of fiction.

441. **History of the English Language (5). Spring.**  
The chronological development of the English language.
450. **Contemporary Poetry (5). Winter. Pr., junior standing.**  
The chief modern poets of England and America.
- 451-2. **Shakespeare (5-5). Fall, Winter, Spring. Pr., junior standing.**  
The first quarter deals with the plays written before 1600, emphasizing comedies; the second, with the plays written after 1600, stressing tragedies.  
Credit for either or both of these courses excludes credit for EH 350.
456. **The English Romantic Movement (5). Spring. Pr., junior standing.**  
Romantic poetry from Gray to Keats.
457. **Victorian Literature (5). Winter. Pr., junior standing.**  
The major poets and non-fiction writers from 1830 to 1890.
459. **Poetry and Prose of the English Renaissance (5). Fall. Pr., junior standing.**  
The nondramatic literature of the Tudor Period.
463. **Eighteenth Century English Literature (5). Spring. Pr., junior standing.**  
Poetry and prose from Johnson through Blake.
- 481-2. **English Novel (5-5). Fall, Winter. Pr., junior standing.**  
The first quarter: Development of fiction from the Greek Romances down through the Renaissance and then concentrates on the great English novelists of the 18th Century. The second quarter: The English novel from Jane Austin to Thomas Hardy.
491. **American Poetry (5). Fall, alternate years. Pr., junior standing.**  
Major American poets from the Colonial period to 1920.
492. **American Drama (5). Fall, alternate years. Pr., junior standing.**  
American dramatic and stage history from Colonial times to the nineteenth century, with emphasis on developing tastes and techniques.
495. **Southern Literature (5). Spring. Pr., junior standing.**  
The poetry, fiction, and non-fiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends.  
Not open to students with credit in EH 365.
- 498-99. **Readings for Honors (5-5). Pr., junior standing with a minimum of 2.0 overall average, a 2.5 average in at least five upper division English courses, and the consent of the English Department.**  
Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.

## GRADUATE COURSES

610. **Introduction to Graduate Study (5). Summer, Fall, Winter.**
- 611-12. **Studies in the History and Interpretation of Literature (5-5). Summers only.**
614. **The Theory of Prose Fiction (5).**  
Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.
- 616-17. **Studies in the American Language (5-5). Summers only.**
620. **The English Language, I: Old English (5). Fall.**
621. **The English Language, II: Middle and Modern English to 1500 (5). Winter. Pr., EH 620.**
623. **Beowulf (5). Winter. Pr., EH 620.**
625. **Medieval Literature (5). Fall.**
626. **Chaucer (5). Spring.**
627. **Linguistics, I: Phonology and Morphology (5). Fall, Summer.**
628. **Linguistics, II: Syntax and Grammar (5). Summer, Winter.**
629. **Linguistics, III: Formal Stylists (5). Spring.**
631. **Elizabethan and Jacobean Drama (5). Fall.**
632. **Spenser (5). Spring 1970. Alternates in Spring with 635.**
633. **Studies in the Poetry and Prose of the English Renaissance (5). Winter.**
634. **Poetry and Prose of the Seventeenth Century (5). Winter.**
635. **Studies in Shakespeare (5). Alternates in Spring with 632.**
636. **Milton (5). Spring.**
640. **Restoration and Eighteenth Century English Drama (5). Spring.**

- 641. Studies in the Age of Pope (5). Fall.
- 642. Studies in the Age of Johnson (5). Winter.
- 650. Studies in English Romanticism (5). Winter.
- 652. Victorian Poetry (5). Spring.
- 653. Victorian Prose (5). Fall.
- 654. Studies in the Nineteenth Century English Novel (5). Spring.
- 660. Modern Poetry (5). Spring.
- 661. Modern Fiction (5). Winter.
- 662. Studies in Twentieth Century Literature (5). Fall.
- 670. American Literature of the Colonial and Revolutionary Periods (5). Spring.
- 671. Studies in American Literature, 1800-1860 (5). Alternates in Summers and Winters with 673.
- 672. Studies in American Literature, 1860-1914 (5). Fall.
- 673. Studies in the Literature of the South (5). Alternates in Summers and Winters with 671.
- 680. The History of Literary Criticism (5). Alternates in Summers and Winters with 681.
- 681. The History of Literary Criticism (5). Continuation of EH 680. Alternates in Summers and Winters with 680.
- 684-85. Directed Individual Study (5-5).
- 690. Continental Romanticism (5).  
Cross-currents and influences among the literature of Europe during the Romantic Period, with attention to the effects of European Romanticism on English writers.
- 699. Research and Thesis (5).
- 799. Research and Dissertation (5).

## Family and Child Development (FCD)

*Professors Hodson and Rose*  
*Associate Professors Barton and Layfield*  
*Assistant Professors Current-Garcia and Hinton*  
*Instructors Crawford and Porter*

- 110. Contemporary Home Economics (1). Fall, Winter, Spring.  
Philosophy and new directions of Home Economics.
- 207. Principles of Child Development (2). Lec. 2.  
Principles of growth and development, with emphasis on infant development. Students observe in the Child Study Laboratories and other situations involving young children.
- 207L. Principles of Child Development Laboratory (1). Lab. 2.  
Laboratory work in child development. Hours to be arranged. Must be taken concurrently with the corresponding lecture course.
- 257. Family and Human Development (3).  
Principles of human development as it is affected by the family and a study of the family as it affects and is affected by the culture.
- 304. Home and Family Life (3). Each quarter.  
Male and female roles in mate choice, marriage, adjustment, parenthood and marriage problems. Open to men and women.
- 307. Growth and Development of Children (3). Lec. 3. Pr., PG 211, SY 201.  
The mental, physical, social and emotional growth and development of children with emphasis on the early years. Students observe and participate in the care of children in the child study laboratories.
- 307L. Growth and Development of Children Laboratory (2). Lab. 4.  
Laboratory work in the child study center. Hours to be arranged. Must be taken concurrently with the corresponding lecture course.
- 317. Adolescent and the Family (5). Pr., HE 207, 307 or consent of instructor.  
Growth and development of the adolescent in relation to formative influences, problem areas, and implications.
- 323. Management For Modern Living (3). Pr., junior standing.  
Management of human and nonhuman resources for the maximum development of the individual and the family.

327. **The Child In A Culturally Disadvantaged Family (5).**  
Conditions in society disadvantageous to growth and development of children.
357. **The Aged and His Family (3).**  
The aged and his family as affected by problems of health, finances, leisure time, housing and relationships.
417. **Guidance of Children (3). Lec. 3. Pr., HE 307, and junior standing.**  
Environmental factors affecting the development of children in the home and community. Emphasis is given to principles and methods of guidance. Students participate in the guidance of the children in both the nursery school and kindergarten.
- 417L. **Guidance of Children Laboratory (2). Lab. 6. Laboratory work in guidance of children. Hours to be arranged. Must be taken concurrently with the corresponding lecture course.**
437. **Teaching Methods in Preprimary Education (3). Lec. 3. Pr., junior standing.**  
Organization and management of a nursery school and kindergarten, including selection of equipment. Special units of work will be given in reading and story telling, nature, music, art, and construction of play materials for children.
- 437L. **Teaching Methods in Preprimary education laboratory (2). Lab. 6. Laboratory work in the child study center. Hours to be arranged. Must be taken concurrently with the corresponding lecture course.**
443. **Home Management Residence (5). Each quarter. Pr., junior standing, HE 110, HE 113, HE 115, HE 116, HE 119, HE 257, HE 323, and HE 431.**  
Residence in the home management house gives actual experience in different phases of homemaking with emphasis placed on the management process, satisfactory group relations, and development of individual initiative.
447. **Directed Teaching in Preprimary Education (5). Lec. 2, Lab. 9. Pr., junior standing and HE 437.**  
An advanced course in Nursery School and Kindergarten Education. The student will assume increasing laboratory responsibilities for the guidance of children under supervision of the staff.
457. **Family Relationships (5). Fall, Spring.**  
Interpersonal relationships among family members, with attention to human development, training and guidance of children.
463. **Family Economics (5). Lec. 5. Winter, Summer. Pr., junior standing, HE 453 or equivalent.**  
Budgeting and consumer problems faced by the family.
467. **Parent Education (5). Lec. 3, Lab. 4. Pr., junior standing and HE 307.**  
Principles of working with parents on both an individual and on a group basis.
497. **Internship In Agencies Serving Children and Families (5-5).**  
Field experiences to be arranged in approved community agencies or groups which work with children and families. All placements to be made on an individual basis and supervised by staff.

## GRADUATE COURSES

601. **Special Seminars in Home Economics (5).**  
A. Child Development and/or Family Life; B. Clothing and/or Textiles; C. Family Economics, Home Management, Equipment and/or Housing; D. Foods and/or Nutrition.
602. **Seminar (1). Winter and Summer.**  
One quarter required for all graduate students in all departments of Home Economics. May be repeated for a maximum of 3 hours credit.
603. **Home Economics in Higher Education (5).**  
The effects of scientific, technological and social developments on the family and the Home Economics profession as they have implications for higher education in this discipline. Emphasis: current trends in subject matter areas, scope and program development, administration, and instructional resources.
605. **Methods of Research in Home Economics (3).**  
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **Research Studies in Home Economics. Credit to be arranged (2-5). Pr., consent of instructor. May be taken more than one quarter. Not to exceed 5 hours credit toward minimum of 45 for M.S. or 48 for M.H.E. degree.**
630. **Trends and Supervision in Home Management (5). Pr., HE 323 and HE 443 or permission of instructor.**  
Developments, trends and supervision in home management.
631. **Readings in Home Management (5). Pr., HE 323.**  
An analysis and evaluation of literature and research studies in Home Management.

634. **Economic Problems of Families (5).** Pr., HE 323, HE 453.  
Income distribution, cost of living, the business cycle, taxation, and economic provisions for unemployment, health, accidents, old age, and dependents.
635. **Advanced Home Management and Equipment (3).** Pr., graduate standing.  
A three-week course offered in summer quarters only.
636. **Analysis of Home Management Problems (5).** Lec. 3, Lab. 4. Pr., HE 323 or equivalent, or consent of instructor.  
Work analysis and adaptation of technological improvements in using management principles of human and non-human resources (time, energy, and income).
670. **Personality Development (5).**  
The development of personality of the child with particular emphasis on the effects of family interaction in the early years.
675. **Pre-School Guidance (5).** Lec. 3, Lab. 4-6. Pr., HE 307.  
An application of methods and techniques of guidance in laboratory groups of pre-school children.
676. **The Family and Its Relationships (5).**  
Intensive study of the family and its effect upon personality development.
677. **Readings in Family Life and Child Development (5).**  
Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult; problems of later maturity; changing family patterns.
678. **Advanced Child Development (5).** Pr., HE 307.  
Growth and development of children with emphasis upon environmental and developmental factors affecting growth and development and implications for guidance. Laboratory experiences where needed.
679. **Group Approaches to Family Problem Solving (5).** Pr., HE 670 and HE 676, or approval of professor.  
The dynamics of the family as a primary group together, with a study of some common family problems. Principles of group interaction in the discussion of family problems.
699. **Research and Thesis. Credit to be arranged.**  
Required of all students under the Thesis Option in any field.

## Foreign Languages (FL)

*Head Professor Peak*

*Research Professor of Comparative Linguistics Skelton*

*Associate Professor Hamilton*

*Assistant Professors Fugler, Helmke, Ladd, Posniak, Reyes, and Warbington*

*Instructors Calvez, Castro, Jones, Millman, Vandegrift, and Wolverton*

Students who have satisfactorily completed two years of a foreign language in high school should continue that language on the intermediate level. College credit will not be granted for an elementary course when the student has received two years credit for that language in high school, except by special permission of the Registrar and Department of Foreign Languages with the approval of the student's dean.

## French

121. **Elementary French I (5).**  
To give the student the fundamentals of the French language together with as much simple reading as time will permit. Constant stress will be placed on oral and aural practice.
122. **Elementary French II (5).** Pr., FL 121 or equivalent.  
A continuation of FL 121.
221. **Intermediate French I (5).** Pr., FL 122 or equivalent.  
Provides practice in reading, writing and speaking current French. Special emphasis is placed on the acquisition of vocabulary through reading and composition.
222. **Intermediate French II (5).** Pr., FL 221 or equivalent.  
An introduction to French literature. Representative works of moderate difficulty and high literary value will be read. Practice in speaking and writing will continue.
321. **Advanced French I (5).** Pr., FL 222 or equivalent.  
Outstanding prose works, especially short stories and novels. Continued emphasis on vocabulary building through composition based on literature read.
322. **Advanced French II (5).** Pr., FL 222 or equivalent.  
A continuation of FL 321.



421. **Contemporary French Literature I (5). Pr., FL 322 or equivalent.**  
Selected readings in the literature of the nineteenth and twentieth centuries. Advanced practice in conversation.
422. **Contemporary French Literature II (5). Pr., FL 322 or equivalent.**  
A continuation of FL 421.
423. **Survey of French Literature (5). Pr., FL 422 or dept. approval.**  
The development of French literature from the Chansons de geste through the classical period.
424. **Survey of French Literature (5). Pr., FL 422 or dept. approval.**  
A continuation of FL 423. The development of French literature from Romanticism to the modern period.
427. **Independent Work in French I (5). Pr., FL 423 or FL 424 or dept. approval.**  
For the superior student majoring in French. A reading course to be completed with a term paper.
428. **Independent Work in French II (5). Pr., FL 423 or FL 424 or dept. approval.**  
For the superior student majoring in French. A reading course to be completed with a term paper.

## Spanish

131. **Elementary Spanish I (5).**  
Structure of the Spanish language, with practice in speaking, reading, and writing.
132. **Elementary Spanish II (5). Pr., FL 131 or equivalent.**  
A continuation of FL 131.
231. **Intermediate Spanish I (5). Pr., FL 132 or equivalent.**  
Designed to acquaint the student with the civilization of Spain while providing practice in reading, speaking, and writing.
232. **Intermediate Spanish II (5). Pr., FL 231 or equivalent.**  
Spanish literature. Representative works of outstanding Spanish writers will be examined. Practice in writing and speaking continues.
331. **Advanced Spanish I (5). Pr., FL 232 or equivalent.**  
Recognized works of Spanish and Spanish-American writers with a review of Spanish grammar and practice in composition and conversation.
332. **Advanced Spanish II (5). Pr., FL 232 or equivalent.**  
A continuation of FL 331. Continued emphasis on vocabulary building through composition and conversation.
431. **Contemporary Spanish-American Literature I (5). Pr., FL 332 or equivalent.**  
Selected readings in Spanish-American Literature as a general survey, but with emphasis on the post-modernismo period. Written and oral reports in Spanish.
432. **Contemporary Spanish Literature II (5). Pr., FL 332 or equivalent.**  
Selected readings in the literature of Spain with emphasis upon the post-civil war period. Written and oral reports in Spanish.
433. **Survey of Spanish Literature (5). Pr., FL 432 or dept. approval.**  
The development of Spanish literature from Poema del mio Cid through the Golden Age.
434. **Survey of Spanish Literature (5). Pr., FL 432 or dept. approval.**  
A continuation of FL 433. The development of Spanish Literature from the Decadencia to the contemporary period.

## German

151. **Elementary German I (5).**  
The structure of the German language, with practice in speaking, reading, and writing.
152. **Elementary German II (5). Pr., FL 151 or equivalent.**  
A continuation of FL 151.
251. **Intermediate German I (5). Pr., FL 152 or equivalent.**  
Provides the student with an understanding of the civilization of Germany while providing practice in reading, writing, and speaking the language.
252. **Intermediate German II (5). Pr., FL 251 or equivalent.**  
German literature. Representative works of various German authors will be studied, with continuing practice in writing and speaking.
351. **Advanced German I (5). Pr., FL 252 or equivalent.**  
Recognized works of German writers, with a review of German grammar and practice in composition.
352. **Advanced German II (5). Pr., FL 252 or equivalent.**  
Recognized works of German writers. Emphasis on vocabulary building through composition.

451. **Contemporary German Literature I (5).** Pr., FL 352 or equivalent.  
Selected readings in German literature of the nineteenth and twentieth centuries. Advanced practice in conversation.
452. **Contemporary German Literature II (5).** Pr., FL 352 or equivalent.  
A continuation of 451.
453. **Survey of German Literature (5).** Pr., FL 452 or dept. approval.  
The development of German literature from the beginnings through the Age of German Classicism (Schiller and Goethe).
454. **Survey of German Literature (5).** Pr., FL 452 or dept. approval.  
A continuation of FL 453. The development of German literature from the Age of Romanticism to the present.
457. **Independent Work in German I (5).** Pr., FL 453 or FL 454 or dept. approval.  
For the superior student majoring in German. A reading course to be completed with a term paper.
458. **Independent Work in German II (5).** Pr., FL 453 or FL 454 or dept. approval.  
For the superior student majoring in German. A reading course to be completed with a term paper.

### Italian

241. **Elementary Italian I (5).** Pr., permission of the instructor.  
The structure of the Italian language, with practice in speaking, reading, and writing.
242. **Elementary Italian II (5).** Pr., FL 241 or equivalent.  
A continuation of FL 241.
341. **Intermediate Italian I (5).** Pr., FL 242 or equivalent.  
The civilization and the literature of Italy while providing practice in reading, writing, and speaking Italian.

### Latin

111. **Elementary Latin I (5).**  
To present the fundamental principles of the language so that the student may progressively develop some ability to read, write, and pronounce the language.
112. **Elementary Latin II (5).** Pr., FL 111 or equivalent.  
Continuation of Latin I with emphasis on rapid reading.
211. **Intermediate Latin I (5).** Pr., FL 112 or equivalent.  
Selections from *Nepos' Lives*, *Caesar's Gallic or Civil Wars*.
212. **Intermediate Latin II (5).** Pr., FL 211 or equivalent.  
Selections from Cicero, Sallust, and Ovid.
311. **Advanced Latin I (5).** Pr., FL 211 or FL 212 or equivalent.  
Selections from Vergil's *Aeneid*, *Eclogues*, and *Georgics*.

### Portuguese

261. **Elementary Portuguese I (5).** Pr., permission of the instructor.  
The structure of the Brazilian language, with practice in speaking, reading, and writing.
262. **Elementary Portuguese II (5).** Pr., FL 261 or equivalent.  
A continuation of FL 261.
361. **Intermediate Portuguese I (5).** Pr., FL 262 or equivalent.  
Brazilian civilization and Luso-Brazilian literature.

### Russian

171. **Elementary Russian I (5).**  
The Russian language, with practice in reading, speaking, and writing.
172. **Elementary Russian II (5).** Pr., FL 171 or equivalent.  
A continuation of FL 171.
271. **Intermediate Russian I (5).** Pr., FL 172 or equivalent.  
Graded reading in Russian for vocabulary building and oral practice.
272. **Intermediate Russian II (5).** Pr., FL 271 or equivalent.  
Readings in Russian civilization and oral practice in use of the language.
371. **Advanced Russian I (5).** Pr., FL 272 or equivalent.  
Readings in Contemporary Russian literature, grammar review and oral practice.

372. **Advanced Russian II (5).** Pr., FL 371 or equivalent.  
A continuation of FL 371.

## GRADUATE COURSES

601. **Linguistic Science (5).** Pr., permission of instructor.  
The various aspects and areas of linguistic study, including an examination of language distribution, relationships, types, changes, and development, and a brief introduction to phonetic structure, grammatical forms, and syntax.
603. **Romance Linguistics (5).** Pr., permission of instructor.  
The development of Latin into the medieval and modern forms of the Romance languages, involving a comparison of Classical Latin with Early and Vulgar Latin and the main changes in phonology, morphology, and syntax of the latter into Italian, Spanish, Portuguese, French, and Roumanian. Some attention will be given to the history of Rome, of the Empire, and of the Celtic, Germanic, and Moorish invasions.
605. **Indo-European Linguistics (5).** Pr., permission of instructor.  
Historical linguistics involving the reconstruction of proto Indo-European and the reflexes in the dialects, especially Latin, Greek, Sanskrit, and Gothic.
631. **Old Spanish Language and Literature (5).**  
The internal and external history of the language together with readings from the *Poema del mio Cid*, Gonzalo de Berceo, Juan Ruiz, and Alfonso el Sabio. The role of the Ligurians, Iberians, Carthaginians, Greeks, Celts, Romans, Vandals, Visigoths, and Moors in the history of Spain and the Spanish language will be examined.
632. **Spanish Prose Fiction to 1700 (5).**  
Development of early prose fiction through the Siglo de Oro, with special emphasis on the works of Cervantes.
633. **Spanish Prose Fiction Since 1700 (5).**  
The continuing development of fiction from the Eighteenth Century to Modern Times, with special attention to the novel of the Twentieth Century.
634. **Spanish Drama to 1700 (5).**  
Development of the drama through the Siglo de Oro, with emphasis on the chief works of Lope de Vega, Calderon, Tirso de Molina, and Ruiz de Alarcón.
635. **Spanish Drama Since 1700 (5).**  
The continuing development of the drama through the Decadencia, Romanticismo, Siglo XIX, Generation de '98, Modernismo, and the Posguerra.
636. **Poetry of Spain (5).**  
The development of poetic forms, of the leading movements and principal poets, from the earliest *jarchas* to the contemporary.
637. **Spanish American Literature (5).**  
A broad survey of the principal literary works of Spanish America from 1500 to the Present.
638. **Spanish Bibliography (5).**  
An intensive examination of the principal sources, collections, texts, histories, dictionaries, reference works, etc., useful to the Spanish scholar.
699. **Research and Thesis (5).**

## Forestry (FY)\*

*Professors DeVall, Christen, Hodgkins, and Johnson*  
*Associate Professors Posey and Somberg*  
*Assistant Professors Beals, DeBrunner, and Larsen*

104. **Forest Cartography (2).** Lab. 6.  
Use of drafting instruments, engineering lettering, conventional map signs and symbols and application to planimetric and topographic maps, map design and grids.
105. **Forestry Convocation (0).** Fall, Winter, Spring.  
A semi-quarterly forum required of all forestry students except in summer quarters. Visiting lecturers from all segments of federal, state, and private forestry will discuss topics of importance to the forest economy and interest to students.
201. **Dendrology (5).** Lec. 3, Lab. 6. Fall. Pr., BI 102, or permission of instructor.  
Taxonomy and identification of the important forest trees of the United States and Canada. The major natural species groups, their geographic distribution and their typical site occurrence are outlined.
203. **Silvics I (5).** Lec. 4, Lab. 3. Winter. Pr., BI 102, CH 104.  
Relationships between site factors and the internal structure, metabolism and growth of individual trees.

\*The prerequisites may be waived, by permission of the instructor concerned, for junior and senior students in other departments.

204. **Forest Mensuration (5).** Lec. 3, Lab. 6. Fall. Pr., CE 201, Coreq., FY 201.  
Measurement theory; methods and equipment used in measuring trees and stands; units of measure used in forestry; log rules and volume tables; condition class mapping; elementary timber estimating; stand and stock tables.
205. **Wood Identification and Uses (3).** Lec. 2, Lab. 3. Fall and Spring.  
Identification of the commercial woods of the United States by macroscopic features. Elementary wood anatomy, sufficient to permit an understanding of wood properties and the suitability of certain woods for specific uses. Introduction to the major uses of wood and the basic principles of lumber grading.
206. **Wood Measurements (3).** Lec. 2, Lab. 3. Winter. Pr., MH 160 or equivalent.  
Wood measurements oriented toward the needs of students in wood technology.
207. **Silvics II (5).** Lec. 3, Lab. 6. Spring. Pr., AY 305, FY 201, FY 203.  
Effects of site, competition and cultural practices on the establishment, development and yield of forest stands. Reciprocal effects of forest cover on the site.
302. **Forest Fire Control and Use (3).** Lec. 2, Lab. 3. Winter. Pr., junior standing.  
Forest fire protection. Use of fire as a silvicultural tool. Public relations problems. Extended field trips will be made.
303. **Forest Recreation (3).** Lec. 1, Lab. 6. Summer.  
Planning and administration of recreation in forest land management. Extended field trips will be made.
309. **Sampling (3).** Lec. 2, Lab. 3. Winter. Pr., MH 162 or consent of instructor.  
Basic statistical and sampling concepts and procedures as applied to forestry problems.
310. **Advanced Mensuration (3).** Lec. 2, Lab. 3. Spring. Pr., FY 204, FY 309.  
Statistical decision theory. Stratified sampling, including testing for effectiveness of stratification, allocation of the sample, and sample size. Inventories with probability proportional to size (point sampling). Forest growth and yield. Nature and use of yield tables. Stand projection methods. Growth percent.
311. **Wood Anatomy (5).** Lec. 3, Lab. 6. Fall. Pr., FY 205.  
Identification of commercial woods of industry by microscopic features. Comparative anatomy and phylogenetic relationships. Introduction to microtechnique and maceration techniques.
313. **Farm Forestry (5).** Lec. 3, Lab. 4. Fall, Winter. Pr., sophomore standing.  
(Not open to students in the degree Forestry curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the forest woodland, especially as they relate to Alabama conditions.
330. **Forest Products (5).** Lec. 3, Lab. 6. Fall. Pr., FY 205 or FY 311.  
Specifications, grading and manufacture of wood products derived from forest lands, including an introduction to pulp and paper manufacture and other chemical and mechanical processes utilizing wood.
390. **Field Mensuration (3).** Lec. 1, Lab. 6. Summer. Pr., FY 310.  
Application of the forest measurement principles to field conditions. Practical experience in forest inventory work on large properties.
391. **Forest Engineering (3).** Lec. 1, Lab. 6. Summer. Pr., CE 201.  
Application of the principles of civil engineering to forest field conditions. Practical experience in road location, land surveying, and topographic surveying for recreational purposes.
396. **Forest Site Evaluation (2).** Lec. 1, Lab. 3. Spring. Pr., GL 102, FY 397, FY 417 and junior standing.  
Theoretical and field training in the classification and evaluation of forest habitats and land for various uses. Overnight field trips are required.
397. **Forest Regeneration (3).** Lec. 1, Lab. 6. Summer. Pr., FY 207.  
Field observation and evaluation of natural and artificial methods of regeneration of forest types, with emphasis on ecological factors. Extended field trips will be made.
407. **Forest Management (5).** Lec. 5. Spring. Pr., FY 420, FY 438 and junior standing.  
General principles applicable to the organization, administration and regulation of forest properties primarily for the production of crops of timber.
408. **Logging (3).** Lec. 2, Lab. 3. Fall. Pr., FY 204.  
Logging methods and the factors affecting the costs in each phase of logging. Field practice given in the safe use of mechanical logging equipment.
413. **Microtechnique of Hard Materials (5).** Lec. 1, Lab. 12. Fall. Pr., FY 311 or permission of instructor and junior standing.  
Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining, and mounting of section.
414. **Regional Silviculture (3).** Lec. 3. Fall. Pr., FY 420 and junior standing.  
The principal forest type groups, their site occurrence, growth, value, and current silvicultural problems and practices, of each of the forest regions of the United States.
415. **Range Management (2).** Lec. 2. Pr., FY 207 or BY 413, and junior standing.  
Survey of range management as applied to forest properties.
417. **Photogrammetry (5).** Lec. 1, Lab. 12. Summer. Pr., FY 310 and junior standing.  
Use of aerial photographs in Forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, form-line mapping, timber type mapping and timber volume estimation.

418. **Advanced Forest Management (3).** Lec. 1, Lab. 6. Spring. Pr., FY 407 and junior standing.  
Review of steps and procedures in preparation of management plans; preparation of management plans for selected areas.
420. **Silviculture (5).** Lec. 3, Lab. 6. Fall. Pr., FY 207 or BY 413 and junior standing.  
Methods of controlling establishment, composition, growth, and quality of forest stands. Overnight field trips, not to exceed three, will be required.
421. **Forest Research Methods (3).** Lec. 2, Lab. 3. Winter and Spring. Pr., FY 309 or MH 163 and junior standing.  
Review of statistical and sampling methods. Experimental design and analysis of data.
425. **Wood Gluing and Lamination (5).** Lec. 3, Lab. 6. Winter. Coreq., FY 311; Pr., PS 205 and junior standing.  
Types and characteristics of woodworking glues. The theory, design, and manufacture of laminates and other glued products. The student will be introduced to research techniques and procedures by pursuing a specific study that will culminate in a comprehensive report.
430. **Physical and Chemical Properties of Wood (5).** Lec. 3, Lab. 6. Spring. Pr., junior standing.  
Physical and chemical properties of wood substances. Advanced wood-liquid relationships, thermal and electrical properties. Chemical processing of explosives, coatings, film and fiber products from wood.
431. **Mechanical Properties of Wood (5).** Lec. 3, Lab. 6. Spring. Pr., junior standing.  
Mechanical properties of wood, factors affecting the strength of wood, principles used in the design of wood structures. Testing procedures.
432. **Seasoning and Preservation of Wood (5).** Lec. 5. Winter. Pr., FY 311 and junior standing.  
Principles and practices of seasoning and impregnation of wood, study of wood destroying agencies.
433. **Seasoning and Preservation Laboratory (2).** Lab. 6. Spring. Pr., FY 432 and junior standing.  
Required for wood technology majors only. Laboratory study of techniques and equipment used in the seasoning and impregnation of wood.
434. **Forest Policy and Law (5).** Lec. 5. Spring. Pr., junior standing.  
Development of forest policy in the United States against the background of cultural heritages and economic situations. Forest Laws, National and State as influenced by and as influencing policy.
435. **Forest Products Marketing (3).** Lec. 2, Lab. 3. Winter. Pr., FY 204, FY 205 and junior standing.  
An introduction to the forest products available for sale from large forest properties, the marketing channels through which they move, their comparative prices and production costs, and their measurement.
436. **Forest Watershed Management (3).** Lec. 2, Lab. 3. Winter. Pr., GL 102 and either FY 203, or AY 304, or AY 305 and BY 413; junior standing.  
A survey of forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
437. **Forest Economics I (3).** Winter. Pr., AS 202 or EC 200 and junior standing.  
Fundamentals of economics as applied to forestry. Supply, demand and price relationships, predictions for the future. Marginal analysis as applied to forestry enterprises. Bases and methods of forest valuation in the determination of stumpage, damages, alternatives and land. Taxes, their valuation and effect upon forest properties. Insurance and credit in forest ventures.
438. **Forest Economics II (3).** Spring. Pr., FY 437 and junior standing.  
Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
440. **Farm Forest Management I (3).** Lec-Dem. 4. Pr., graduate standing.  
Field demonstrations to be arranged. Methods of measuring forest products and computing volumes and growth of trees and stands applicable to forest practice in farm woodlots. Methods of thinning, stand improvements, and harvesting, applicable to woodlot management.
450. **Small Woodland Management (5).** Summer. For majors in Education or Agricultural Education, by consent of instructor.  
The importance of small forest holdings in the national, regional, and state economies. An evaluation of trends in ownership patterns and their related problems. Characteristics used in recognition of forest stands comprising major forest types. Principles of forest management and their application.
460. **Wildland Recreation Philosophy and Policy (3).** Spring.  
An examination of the philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation will be discussed.

461. **Recreational Land Classification (3).** Lec. 1, Lab. 6. Summer. Pr., FY 460.  
Land classification for various recreational uses will be reviewed and discussed from an economic viewpoint. Extended field trips will be required.
469. **Recreational Site Management (3).** Spring. Pr., FY 461, Coreq., FY 407.  
Management of recreational sites so as to take into account all of the resources of the land as well as the human and economic forces influencing that management will be examined.
480. **Senior Thesis (5).** Pr., senior standing.  
A problem in the student's area of interest. Will test ability of student to do thorough library research as well as any needed laboratory or field work. A comprehensive report, written in the style of a graduate thesis, is required.
490. **Seminar in Forestry (1).** Spring. Pr., senior standing.  
Advanced study of current literature and recent developments, with written and verbal reports on selected problems. Required of all graduate students in forest management and wood technology and all seniors in the Honors Program.

## GRADUATE COURSES

601. **Wood Chemistry (5).** Lec. 2, Lab. 9. Spring. Pr., FY 430, CH 203.  
Detailed study of the physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. The chemical analysis of wood.
610. **Forest Tree Improvement (5).** Lec. 4, Lab. 3. Spring. Pr., ZY 300 or consent of instructor.  
Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
611. **Forest Soils (5).** Lec. 3, Lab. 6. Fall. Pr., AY 304 or AY 305.  
Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
617. **Forest Inventory (5).** Lec. 4, Lab. 3. Winter. Pr., FY 417, FY 310.  
Design and analysis of large scale timber volume and growth appraisals, continuous forest inventory and use of electronic computing equipment in forest inventory operations.
640. **Farm Forest Management II (3).** Lec. 4. Pr., FY 440 and graduate standing.  
Organization of the farm woodlot for continuous forest production. Methods of balancing cut and drain, and plans for the efficient administration of the woodlot as a business.
691. **Directed Study (1-5).** All quarters. Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards the Master of Science degree.  
Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, and (P) Timber Physics.
695. **Special Problems (3 to 8 hrs.).** All quarters.  
A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. The work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
699. **Research and Thesis.** Credit to be arranged.

## Foundations of Education (FED)

Head Professor Willers

Professors Holloway and Punke

Associate Professor Phillips

Assistant Professors Conary, Herbert, Lauderdale, Schuessler,  
Shantz, Todd, Walter

Instructors Easley, Kim, McCullers, Robison, Schomberg, \*Young

## Undergraduate

213. **Human Growth and Development (5).** Lec. 4, Lab. 2. All quarters. Pr., sophomore standing. Required of all students completing the Teacher Education Program.  
Analysis of the function of the teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences provided.

\*Temporary.



214. **Psychological Foundations of Education (5).** Lec. 4, Lab. 2. All quarters. Pr., sophomore standing, FED 213 or equivalent. Required of all students completing the Teacher Education Program.  
The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
320. **Social Foundations of Education (5).** Lec. 4, Lab. 2. All quarters. Pr., junior standing, FED 214; SY 201 or equivalent and 5 additional hours of Social Science. Required of all students completing the Teacher Education Program.  
Analysis of the social roles of the school in American culture, the influence of the school and the teaching profession on other institutions, and the social forces and crucial issues which affect education. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
480. **Philosophical Foundations of Education (5).** All quarters. Pr., senior standing, FED 320 or equivalent, professional internship or approval of adviser(s). Required of all students completing the Teacher Education Program.  
The development of educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.

#### Advanced Undergraduate and Graduate

420. **Educational Sociology (5).** Pr., junior standing, FED 320 and SY 201 or equivalents.  
Analysis of the school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.
434. **Personality Dynamics and Effective Behavior (5).** Pr., junior standing and ten hours of psychology.  
Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.
451. **Advanced Educational Psychology (4).** Lec. 3, Lab. 3. Pr., junior standing and nine hours of psychology.  
Analysis of conceptual learning and problems in programmed instruction.

#### Graduate

600. **Education in Modern Society (5).** Pr., graduate standing. (Not open to students with credit in ED 635.)  
Analysis and interpretation of the interaction of historical, philosophical and sociological considerations affecting education in modern society.
601. **Social Foundations of Education (5).** Pr., FED 600. (Not open to students with credit in AD 601.)  
Man as a social being, an analysis of his relationships, his social inventions, including community organization and structure, mores, value patterns, decision making and their significance for education.
634. **History of Education (5).** Pr., FED 600.  
The emergence of education as a formal institution, tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
636. **Philosophy of Education in America (5).** Pr., FED 600.  
Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
637. **Development and Status of Educational Philosophy (5).** Pr., FED 600; FED 636 or consent of department chairman.  
Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
639. **Comparative Education (5).** Pr., FED 600; two quarters of graduate study or consent of department chairman.  
Comparison among the educational systems of leading foreign countries and the United States, giving attention to the historic origins of different systems and to their present sociological and philosophical significance.
645. **Current Problems and Issues in the Foundations of Education (5).** Pr., teaching experience.  
Interpretation of selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.

646. **Studies in Education (1-3). Pr., one quarter of graduate study.**  
Study of a problem using research techniques, to be selected in consultation with the supervising professor. A problem should be selected which will contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)
647. **Foundations in Curriculum and Teaching (5).**  
Development of curriculum patterns and teaching materials reviewed in terms of recent investigations and experimentation; conflicting conceptions of the nature of the curriculum and the sociological, philosophical and psychological implications of these conflicts; methods of curricular reorganization in the elementary and secondary schools.
650. **Seminar in Foundations of Education (5). Pr., consent of the department chairman.**  
Independent study of social and philosophical issues and their impact on education. Examination of issues by utilizing social philosophies and the techniques of analysis from the social sciences.
661. **Research and Experimentation in Education (5).**  
Emphasis given to research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
672. **Statistical Methods in Education (5).**  
The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
673. **Research and Experimental Design (5). Pr., FED 672.**  
Relationship of design to validity; significance of variables, testing hypotheses, evaluation of research and research findings.
675. **Advanced Statistical Methods in Education (5). Pr., FED 672.**  
Analysis of variance and covariance; correlational analysis and linear regression. Simple and complex factorial designs applied to educational research.

## Geology (GL)

*Head Professor Carrington*

*Assistant Professor Cahoon*

*Instructor Taylor*

101. **Introductory Geology I (5). Lec. 4, Lab. 2. All quarters.**  
The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building.  
[NOTE: GL 101 and 102 (Introductory GL I and II) replace GL 101 (Principles and Processes of Geology) taught during the Academic year 1967-68. Credit will not be allowed for both Principles and Processes of Geology and Introductory Geology I and II.]
102. **Introductory Geology II (5). Lec. 4, Lab. 2. All quarters.**  
Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportation, and depositional aspects of groundwater, streams, oceans, glaciers, and wind.  
[NOTE: GL 101 and 102 (Introductory GL I and II) replace GL 101 (Principles and Processes of Geology) taught during the Academic year 1967-1968. Credit will not be allowed for both Principles and Processes of Geology and Introductory Geology I and II.]
103. **Historical Geology (5). Lec. 4, Lab. 2. Spring. Pr., GL 101 or 102.**  
Methods of geochronometry, with emphasis on the fossil record. Survey of the physical history of the earth, with particular attention to the U.S.
201. **Geological Field Methods (2). Lab. 5. Winter. Pr., GL 101 or 102.**  
The instruments and methods used in geological fields mapping.
301. **Mineralogy I (5). Lec. 4, Lab. 2. Fall. Pr., CH 102 or equivalent.**  
Crystal chemistry and crystallography.
302. **Mineralogy II (5). Lec. 4, Lab. 2. Winter. Pr., GL 301.**  
Identification, description, and classification of representative minerals and mineraloids.
311. **Invertebrate Paleozoology (5). Lec. 4, Lab. 2. Fall. Pr., BY 101, ZY 101 or equivalent.**  
Identification, description, and classification of representative fossils of several phyla of the Animal Kingdom.
312. **Paleobotany (5). Lec. 4, Lab. 2. Winter. Pr., BY 101, ZY 101, or equivalent.**  
Identification, description, and classification of representative fossils of several phyla of the Plant Kingdom.
342. **Geology (3). Lec. 3. Pr., CH 104 or sophomore standing.**  
General geology including the common minerals and rocks, geologic processes, and a brief survey of historical geology. Credit for GL 101, GL 102, or GL 103 excludes credit for this course.

401. **Sedimentation-Sedimentary Petrology (5).** Lec. 4, Lab. 2. Fall. Pr., GL 302 or consent of instructor.  
Principles involving transportation and deposition of marine and non-marine sediments, and megascopic description and classification of rocks that result from such processes.
402. **Structural Geology-Metamorphic Petrology (5).** Lec. 4, Lab. 2. Winter. Pr., GL 302.  
Principles of rock deformation, and megascopic description and classification of geological structures and rocks that result from deformative forces.
403. **Igneous Geology and Petrology (5).** Lec. 4, Lab. 2. Spring. Pr., GL 302.  
Principles of intrusive and extrusive igneous activity, and megascopic description and classification of rocks that result from such processes.
411. **Stratigraphy (5).** Lec. 4, Lab. 2. Spring. Pr., GL 312, 401, 402, 403.  
Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on formation, composition, sequence, and correlation of stratified rocks.
421. **Economic Geology I (5).** Lec. 4, Lab. 2. Fall. Pr., GL 402, 403.  
The origin and classification of mineral deposits formed by igneous and metamorphic activity. Introduction to methods of prospecting.
422. **Economic Geology II (5).** Lec. 4, Lab. 2. Spring. Pr., GL 401.  
The origin and classification of mineral deposits formed by surficial processes. Introduction to methods of prospecting.
431. **Research Methods and Application (1-6).** All quarters. Pr., senior majoring in geology, or consent of departmental faculty upon receipt of acceptable proposal.  
Actual research projects and participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of six credit hours.
450. **Earth Science for Teachers I (5).** Summer Quarter. Pr., acceptance as participant in NSF-sponsored, College-School Cooperative Program.  
Earth as a planet—its position in space and relationship to other celestial bodies, the origin of Earth and its atmosphere and oceans. Introduction to meteorology, oceanology, and geophysics.
451. **Earth Science for Teachers II (5).** Summer Quarter. Pr., acceptance as participant in NSF-sponsored, College-School Cooperative Program.  
The materials of earth and geologic processes affecting Earth: introduction to origin and classification of minerals, rocks, and geologic structures; surficial processes of erosion and deposition. Brief survey of Earth's history.

## Health, Physical Education and Recreation (HPR)

*Head Professor Fourier*

*Professors Francis, Land, Means, and Umbach*

*Associate Professors Evans, Fitzpatrick, and Young*

*Assistant Professors Bengtson, Dragoin, Martincic, Puckett, Rosen,*

*Turner, Waldrop, and Washington*

*Instructors Barrington, Bond, Brand\*, Bridges, Brock\*,*

*Chapman, Cherellia, Clackler, Ginanni\*, James\*, McCampbell\*, Moore\*, and Tatum*

The instructional program of the Department of Health, Physical Education and Recreation comprises (1) courses in health and physical education for students in the university liberal education program, (2) courses for students majoring and minoring in health and physical education, and (3) courses for students in preparation for teaching.

### University Physical Education Requirements

Three quarters of physical education are required by the University for graduation. Any deficiencies in physical education incurred at Auburn University or elsewhere must be cleared prior to graduation. Only one credit per quarter is permitted or transferable to meet the three-quarter requirement.

**Health Classification.** Each student is assigned a health classification of "A", "B", or "C" and is issued a health card which identifies courses for which he is eligible. The "A" classification is assigned to students who are free from health problems; the "B" classification is assigned to students who may be restricted from par-

\*Temporary.

ticipating in certain phases of the program; the "C" classification is assigned to students who are restricted from participating in any vigorous physical activity. Students may request re-classification whenever changes in health status or physical condition occur.

**Course Requirements.** Students with an "A" health classification are required to take HPR 101, Foundations of Physical Education, during their first quarter of physical education. Those who do not have sufficient skill in swimming to assure their own safety in and around water are required to take HPR 102, Beginning Swimming (Department of Health, Physical Education, and Recreation administers a test to determine each student's swimming ability.) Students who take swimming choose one course from Group I or II listed below for their third quarter's work. Students who do not take a swimming course must select one course from Group I and one course from Group II in completing their three quarters of physical education.

Students with "B" or "C" classifications are required to take either HPR 101, Foundations of Physical Education, or HPR 100, Foundations of Physical Education for the Atypical as marked on their health cards. During subsequent quarters they are expected to meet the other requirements stated above as nearly as their medical restrictions will allow. Specific course selections should be made on the recommendations of the Department of Health, Physical Education and Recreation.

**Credit.** All courses carry one hour credit per quarter (maximum of six quarter hours allowed on degree). No student may receive credit for a course in which he has previously earned credit.

Students may not register for a beginning level course (Groups I and II) after having earned credit in the sport or dance area on an advanced level (Group III). Credit cannot be earned for a 200 and a 300 level course in the same sport.

**Electives.** Three quarter hours credit may be earned in addition to the three quarter hours required. Elective courses may be chosen from Groups I, II, and III.

**100. Foundations of Physical Education for the Atypical (I).**

Designed for the individual with anatomical and functional defects.

**101. Foundations of Physical Education (I).**

Understanding the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.

**102. Beginning Swimming (I).**

Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.

**103. Swimming for the Atypical (I).**

Provides water therapy, an understanding of adaptive movements, and aquatic skills.

**107. Sports and Dance in American Culture (I). (Atypical).**

**114. Recreational Sports for the Atypical (I).**

Survey of recreational pursuits for students with physical limitations: billiards, bicycling, croquet, darts, hiking, horseshoes, net games, and shuffleboard.

**115. Adapted Physical Education (I).**

Concerned with the improvement and correction of physiological and anatomical remedial defects.

**Group I (Vigorous)\***

**116. Weight Control (I).**

Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications "A", "B", and "C".

**125. Basketball (I).**

**126. Touch Football (I).**

**127. Soccer-Speedball (I).**

**130. Boxing (I).**

**131. Fencing (I).**

\*Vigorous activities having special value with respect to development and maintenance of physical condition.

- 132. Wrestling (1).
- 134. Judo (1).
- 135. Weight Training (1).
- 136. Track (1).
- 137. Handball (1).
- 140. Apparatus (1).  
Understanding of gymnastics and skill in the use of different apparatus.
- 141. Trampoline (1).
- 142. Tumbling (1).
- 145. Contemporary Dance (1).  
An understanding of dance as an art form.
- 146. Tap Dance (1).
- 147. Ballet (1).  
Fundamentals and terminology of classical ballet.

#### Group II (Recreational Skills)\*\*

- 150. Intermediate Swimming (1).
- 155. Angling (1).  
Skills in bait and fly casting. Selection and care of tackle.
- 156. Archery (1).
- 157. Badminton (1).
- 158. Bowling (1).
- 159. Golf (1).
- 162. Rifle Marksmanship (1).  
Open to students in Air, Army and Navy ROTC.
- 163. Tennis (1).
- 165. Camping (1).  
Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
- 166. Family Recreation (1).  
Leisure time activities suitable for the family.
- 168. Basic Equitation (1).
- 170. Folk Dance (1).
- 172. Social Dance (1).  
Mixers, as well as ballroom dances: foxtrot, waltz, rhumba, tango, and other representative Latin dances.
- 180. Softball (1).
- 181. Volleyball (1).

#### Group III (Advanced — Elective)

- 250. Synchronized Swimming (1).  
A creative approach to individual and group composition of water ballet stunts and stroke adaptations.
- 251. Life Saving (1).  
Skills leading to certification in Red Cross Senior Life Saving.
- 259. Advanced Golf (1).
- 263. Advanced Tennis (1).
- 325. Varsity Basketball (1).
- 326. Varsity Football (1).
- 332. Varsity Wrestling (1).
- 336. Varsity Track (1).
- 337. Varsity Cross Country (1).
- 340. Competitive and Exhibitional Gymnastics (1).
- 359. Varsity Golf (1).
- 363. Varsity Tennis (1).
- 380. Varsity Baseball (1).

\*\*Activities having special value as healthful, lifetime recreational pursuits.

**110. Health Science (3).**

Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.

**111-112-113. Health Science (1-1-1).**

(111) Concepts related to health and college life, nutrition, maintaining the body, and consumer health choices; (112) mental health, stimulants and depressants, family living, and chronic-degenerative diseases; (113) community health problems, communicable diseases, and safety education.

**Courses for the Major and the Minor****106. Developmental Activities: Theory and Techniques (2). Lec. 1, Lab. 4.**

Body mechanics, callisthenics, movement fundamentals, weight training.

**133. Combatives: Theory and Techniques (2). Lec. 1, Lab. 4.**

Boxing, fencing, and wrestling.

**167. Individual and Dual Sports: Theory and Techniques (2). Lec. 1, Lab. 4.**

Archery, badminton, bowling, golf, and tennis.

**190. Apparatus and Tumbling: Theory and Techniques (2). Lec. 1, Lab. 4.**

Apparatus, stunts, tumbling, pyramids, and trampoline.

**191. Team Sports: Theory and Techniques (2). Lec. 1, Lab. 4.**

Basketball, field hockey, soccer, softball, speedball, and volleyball.

**201. Introduction to Physical Education (5). Lec. 5. Fall, Winter, Spring.**

Physical education from the earliest periods to the present. Emphasis is placed on the physical, biological and psychological principles of physical education.

**202. Basketball (Men) (3). Lec. 2, Lab. 2. Fall.**

The fundamental skill techniques of basketball—offense, defense, and strategy.

**206. Football (Men). Lec. 2, Lab. 2. Winter.**

The fundamentals of football and the different types of offense, defense, team strategy and generalship.

**212. Elementary School Activities (3). Lec. 2, Lab. 2.**

Physical education activities suitable for the first six grades including teaching devices.

**214. Kinesiology (5). Lec. 5. Pr., VM 220-221, PS 204.****221. Aquatics: Theory and Techniques (2). Lec. 1, Lab. 4.**

Water sports, scuba diving, operation and maintenance of pools.

**278. Social and Folk Dance: Theory and Techniques (2). Lec. 1, Lab. 4.**

Basic skills, fundamental knowledge and appreciation of social and folk dance.

**280. Basketball Officiating (1). Lab. 3.**

Discussions, practices, and leadership experiences.

**284. Softball Officiating (1). Lab. 3.**

Discussions, practices, and leadership experiences.

**288. Volleyball Officiating (1). Lab. 3.**

Discussions, practices, and leadership experiences.

**301. Recreation Leadership (5). Lec. 5. Winter, Summer.****302. Alcohol, Narcotics, and Tobacco (3).**

Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.

**303. Baseball (3). Lec. 2, Lab. 2.**

Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.

**304. Track and Field (3). Lec. 2, Lab. 2.**

Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.

**311. Conduct of Dance for High School and Recreation Programs (3). Lec. 2, Lab. 3. Pr., completion of PE 278 or equivalent.**

Providing experiences in analyzing, selecting and presenting dance for high school and recreation programs.

**312. Theory and Conduct of Team Sports for Women (3). Lec. 2, Lab. 3.**

Lead-up games, skill techniques, rules, and skill tests; practice and application of the skills and principles of team sports.

**313. Theory and Conduct of Individual and Dual Sports (3). Lec. 2, Lab. 3.**

Skills, techniques, rules, and skill tests; practice and application of the skills and principles of individual and dual sports.

**314. Theory and Conduct of Gymnastics (3). Lec. 2, Lab. 3.**

Skills and techniques for teaching apparatus, stunts, and tumbling.

**316. Tests and Measurements (3).**

Analysis, administration, and interpretation of tests and measurements in health, physical education and recreation.



317. **School Health and Health Education (5). Lec. 5.**  
Basic scientific health knowledge and its application to the school program. Includes principles, materials, and techniques of health education in elementary and secondary schools.
318. **Principles of Recreation (5). Lec. 5.**  
The significance and meaning of leisure; theories of play; the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
319. **Outdoor Recreation (5). Lec. 5.**  
Outdoor recreation in the United States. Includes principles of planning for recreational use of open land, forests, farms and water.
351. **Red Cross Water Safety (3). consent of instructor.**
403. **Red Cross First Aid (3).**
370. **Dance Survey (3). Lec. 2, Lab. 2.**  
Explores styles and types of dance through the ages in relation to music, drama, architecture and art.
372. **Dance Production and Rhythmic Demonstrations (3). Lec. 2, Lab. 2.**  
Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
401. **Organization and Administration (5). Lec. 5. Fall and Spring. Pr., senior standing.**  
Administration of intramural and physical education activities; also the construction and care of the physical education plant and departmental organization.
404. **Athletic Injuries (3).**  
Athletic injuries as to care, prevention, and correction.
405. **Physiology of Muscular Activity (3). Pr., VM 220-221.**  
Inter-relationships of muscular activity and physiological variations.
416. **Adaptive Physical Education (3). Lec. 3. Spring. Pr., PE 214, VM 220 and 221.**  
Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.

#### Advanced Undergraduate and Graduate

409. **Advanced Health Science (5). Pr., consent of instructor and junior standing.**  
Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
417. **Physical Education for The Mentally Retarded (5).**
419. **Current Problems in Health Education (5). Pr., consent of instructor and junior standing.**  
A critical analysis of the problems, issues, and trends in health education.

#### Graduate

619. **Scientific Principles Applied to Physical Education and Athletics (5). Pr., undergraduate major or minor in health and physical education.**  
Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
626. **Physical Fitness, a Critical Analysis (5). Pr., VM 220-221 or departmental approval.**  
Critical analysis of physical fitness objective of physical education through inquiry into current research in medicine, physiology of muscular activity, and physical fitness appraisal and guidance.
669. **Physiology of Exercise (5). Pr., undergraduate major or minor in health and physical education.**  
Experiences in the physiology of muscular activity and application of these to physical education and athletic situations.
699. **Thesis Research. (Credit to be arranged.) May be taken more than one quarter.**

#### Professional Courses

##### Undergraduate

104. **Orientation (1).**  
Helps transfers from other curricula to understand teacher education and teaching as a profession.
105. **Orientation (1).**  
Helps freshmen in planning their professional careers.
108. **Introduction to Laboratory Experiences (1).**  
Required of all students completing the Teacher Education Program. Orientation to the total laboratory experiences program in the School of Education with specific attention to the orientation and initiation of the pre-teaching field experiences program.

414. **Teaching in Health and Physical Education in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.  
(For description, see Interdepartmental Education.)
423. **Program in Health and Physical Education in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.  
(For description, see Interdepartmental Education.)

Undergraduate students with a major in health, physical education and recreation will pursue a minor selected from some other teaching area in the secondary school program or in one of the areas included in the twelve-grade program. (For appropriate course in Teaching or Program, see SED, IED, and VED.)

425. **Professional Internship in Health and Physical Education in Elementary and Secondary Schools (15).** Pr., Sr. standing, Admission to Teacher Education three quarters prior to Internship, minimum of two appropriate Teaching and Program Courses.  
(For description, see Professional Internship in School of Education.)
429. **Problems of Health Education and Health Observation of School Children (5).** Pr., junior standing.

Helps the teacher with the details of health observation, aids in health guidance of individual pupils, acquaints the teacher with the health services available through local and state departments.

### Graduate

The following courses are organized and taught on a twelve-grade basis:

646. **Studies in Education (1-3).** Pr., one quarter of Graduate study.  
A problem using research techniques to be selected in consultation with the supervising professor. A problem should be selected which will contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)

Each of these courses, HPR 651 and 652, applies to the following areas of the elementary and secondary school programs: (A) Health Education, and (B) Physical Education. Credit may not be earned in both A and B of the same course.

651. **Research Studies (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Review, analysis and interpretation of available research in health education or physical education with emphasis on designing new research to meet changing needs of the school.
652. **Curriculum and Teaching in Elementary and Secondary Schools (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement in health education or physical education.
653. **Organization of Program in Health and Physical Education in Elementary and Secondary Schools (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Advanced course. Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **Evaluation of Program in Health and Physical Education in Elementary and Secondary Schools (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of health and physical education with the total school program and with other educational programs of the community.

### History (HY)

*Head Professor McMillan*

*Alumni Professor Rea*

*Professors Belser, Harrison, Iiams, Ivey, Maehl, and Partin*

*Associate Research Professor Owsley*

*Associate Professors Jones, Newton, Reagan, and Williamson*

*Assistant Professors Bond, Eaves, Henson, and Storey*

*Instructors Cronenberg, Hall, Atkins\*, M. Newton\*, Latimer\**

101. **World History (3).**

A survey of world civilization from prehistory to 1350.

\*Temporary.

102. **World History (3).**  
A survey of world civilization from 1350-1789.
103. **World History (3).**  
A survey of world civilization from 1789 to the present.
- 105-205-305-405. **Current Events (1).**  
The events of the world today based on current periodicals.
201. **A History of the United States to 1865 (5).**
202. **A History of the United States Since 1865 (5).**
300. **Introduction to Latin American History (5). Pr., sophomore standing.**  
A survey of Latin American civilizations to the present with emphasis on the Colonial Period.
301. **Introduction to Far Eastern History (5). Pr., sophomore standing.**  
A brief survey of the major cultural and institutional developments of the area.
311. **Medieval History (5). Pr., sophomore standing.**  
Europe from the fall of the Roman Empire to the Age of Discovery.
315. **American Negro History (5). Sophomore standing.**  
Racial and cultural origins of the Negro, including African background, the slave trade, the development of the labor system, emancipation, and the recent transition of the Negro from a predominately agrarian economy to that of an industrial urban complex.
320. **History of Russia (5). Pr., sophomore standing.**  
The Russian people from early times to the present. Particular emphasis is laid on present domestic institutions and foreign policy.
322. **The United States in World Affairs (3). General elective. Pr., sophomore standing.**  
The influence which the United States has exerted in international affairs.
350. **History of Political Parties (5). Pr., sophomore standing.**  
Emphasis is placed on the origin and growth of American political parties from the Federalist era to the present.
371. **History of the West (5). Pr., sophomore standing.**  
The development of the West and of its influence on American history.
381. **History of Alabama (5). Pr., sophomore standing.**  
A brief history of Alabama from the beginning to the present.
400. **American Colonial History (5). Pr., junior standing.**  
The political, economic and social history of the colonies from their founding to the end of the French and Indian War, 1763.
401. **The American Revolution and the Confederation, 1763-1789 (5). Pr., junior standing.**  
The new British Colonial policy, the War for Independence and the first federal constitution and the movement to replace it.
402. **Federalist and Jeffersonian America, 1789-1815 (5). Pr., junior standing.**  
The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.
403. **The American System and Jacksonian Democracy, 1815-1850 (5). Pr., junior standing.**  
Nationalism, sectionalism, egalitarianism and expansion.
404. **The Civil War (5). Pr., junior standing.**  
The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and of the military, economic, social, and political aspects of the war.
405. **The Reconstruction Period (5). Pr., junior standing.**  
An analysis of the social, economic and political aspects of the years 1865-1877.
406. **Recent United States History, 1877-1914 (5). Pr., junior standing.**  
The political, economic, diplomatic, social and cultural development of the United States.
407. **Recent United States History, 1914-1932 (5). Pr., junior standing.**  
Political, economic, and social development of the United States.
408. **Modern America, 1932 to the Present (5). Pr., junior standing.**  
Political, economic, and social development of the United States.
409. **United States Diplomacy to 1890 (5). Pr., junior standing.**  
Chief events in our relationships with foreign powers from the Revolutionary War to 1890.
410. **United States Diplomacy Since 1890 (5). Pr., junior standing.**  
The emergence of the United States from a hemispheric power to a total involvement in world affairs.

411. **Social and Intellectual History of the United States to 1876 (5). Pr., junior standing.**  
Selected areas of American thought are studied in their social context, ranging from Puritanism to the impact of Darwinism on the American mind.
412. **Social and Intellectual History of the United States Since 1876 (5). Pr., junior standing.**  
An examination of major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
413. **The South to 1865 (5). Pr., junior standing.**  
The origins and growth of distinctive social, economic, cultural and ideological patterns in the South with emphasis on period 1815-1860.
414. **The South Since 1865 (5). Pr., junior standing.**  
Major trends in the South since the Civil War with emphasis on social, economic, cultural and ideological development.
426. **The Reformation Era, 1500-1600 (5). Pr., junior standing.**  
Europe during the Protestant and Catholic Reformations, overseas discovery, and political developments in the age of Charles V, Henry VIII, Elizabeth and Philip II.
427. **The Seventeenth Century (5). Pr., junior standing.**  
Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization and European political developments in the age of Louis XIV.
428. **The Age of Reason, 1715-1789 (5). Pr., junior standing.**  
A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
429. **The French Revolution, 1789-99 (5). Pr., junior standing.**  
Background, causes and course of the Revolution in France.
430. **History of Europe from Bismarck through the First World War (5). Pr., junior standing.**  
Emphasis upon Central Europe, Germany and Italy since unification.
431. **History of Europe Since the Treaty of Versailles (5). Pr., junior standing.**  
Emphasis on the rise to totalitarianism, the Second World War, and the post-war period. (Offered alternate years with HY 430.)
432. **Medieval German History (5). Pr., junior standing.**
433. **Modern German History (5). Pr., junior standing.**
435. **Napoleonic Europe, 1799-1815 (5). Pr., junior standing.**  
The rise and fall of the Consulate and the Empire in France and French hegemony in Europe.
436. **Modern France (5). Pr., junior standing.**  
From the Ancien Regime to the present.
437. **European Diplomatic History, 1815-1919 (5). Pr., junior standing.**  
International relations of the Great Powers from Vienna to Versailles.
443. **History of Europe 1815-1850. Pr., junior standing.**
450. **History of China (5). Pr., junior standing and HY 301.**  
A more intensive study of China emphasizing its dominant role in the Far East.
451. **Japan and Southeast Asia (5). Pr., junior standing and HY 301.**  
A more intensive study of the cultures of Eastern Asia emphasizing the impact of the West in the recent period.
452. **The Caribbean Area (5). Pr., junior standing and HY 300.**  
An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
453. **Modern South America (5). Pr., junior standing and HY 300.**  
Colonial background and the cultural development of 19th and 20th century South America.
454. **History of Mexico (5). Pr., junior standing and HY 300.**  
An analysis of the unique cultural development of Mexico.
455. **Modern Brazil (5). Pr., HY 300 and junior standing.**  
Portuguese America from Independence to the present.
460. **Great Leaders of History (5). Pr., junior standing.**  
Some world leaders and their relationship to the great movements of history.
471. **History of Medieval England (5). Pr., junior standing.**  
A survey of English origins and institutions to the 17th century.
472. **History of Modern England (5). Pr., junior standing.**  
A survey of British history since the 17th century.

## GRADUATE COURSES

- 600. Seminar in American History, 1763-1800 (5).
- 601. Seminar in American History, 1800-1850 (5).
- 602. Seminar in American History, 1850-1876 (5).
- 603. Seminar in American History, 1876-1914 (5).
- 604. Seminar in American History, 1914- (5).
- 605. United States Far Eastern Diplomacy (5).
- 606. United States Latin American Diplomacy (5).
- 607. United States Atlantic Diplomacy (5).
- 608. Seminar in American Social and Intellectual History (5).
- 609. Seminar in the Old South (5).
- 610. Seminar in the New South (5).
- 611. Seminar in State and Local History (5).
- 629. Historical Methods (5).
- 634. History of Revolutions (5).
- 635. Seminar in European History (5).
- 636. Colonial Latin America (5).
- 637. Latin America in the National Period, Revolutionary Movements and National Developments (5).
- 638. Seminar in the French Revolutionary and Napoleonic Era (5).
- 639. Historiography and Theory of History (5).
- 640. Seminar in Tudor and Stuart England (5).
- 641. Seminar in 18th Century England (5).
- 650. Cultural and Institutional Foundations of World History (5).
- 699. Research and Thesis (5).

## READING COURSES

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

- 620. Directed Reading in American History to 1876 (5).
- 621. Directed Reading in American History Since 1876 (5).
- 622. Directed Reading in American Diplomacy (5).
- 623. Directed Reading in American Social and Intellectual History (5).
- 624. Directed Reading in Latin American History (5).
- 625. Directed Reading in Far Eastern History (5).
- 626. Directed Reading in English History (5).
- 627. Directed Reading in European History (5).

## Horticulture (HF)

*Professors Perkins, Amling, Jones, and Orr*  
*Associate Professors Fisher, Harris, and Norton*  
*Assistant Professors Moore and Sanderson*  
*Instructors Martin and Turner*

## Landscape and Ornamental Horticulture

- 101. **Introduction to Horticulture (1). Lec. 1.**  
 An orientation course for freshman introducing all fields in Horticulture.
- 221. **Landscape Gardening (5). Lec. 3, Lec-Dem. 4.**  
 Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plantings.
- 222. **Trees (5). Lec. 3, Lab. 4.**  
 Identification, culture and use of ornamental trees in landscape plantings.

223. **Evergreen Shrubs and Vines (5).** Lec. 3, Lab. 4.  
Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
224. **Plant Propagation (5).** Lec. 3, Lab. 4.  
Basic principles and practices involved in the propagation of horticultural plants.
225. **Flower Arranging (3).** Lec. 2, Lab. 2. General elective.  
Principles and practices of flower arranging for the home.
321. **Deciduous Shrubs and Vines (5).** Lec. 3, Lab. 4.  
Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
323. **Greenhouse Construction and Management (5).** Lec. 3, Lab. 4.  
Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
325. **Landscape Planning of Home Grounds (5).** Lab. 15. Pr., HF 221.  
Planning of large and small home grounds.
326. **Landscape Planning of Public Grounds (5).** Lab. 15. Pr., HF 221.  
Planning of public areas and grounds of public buildings, including general layout, planting and detail treatment of special areas.
327. **Landscape Engineering (3).** Lec. 1, Lab. 6. Summer. Pr., FY 201 or permission of instructor.  
Emphasis on the appreciation of forests for esthetic values as well as for production of various forest products. An evaluation of forest areas for recreational purposes. Consideration of campsite requirements, access and circulation as well as other phases of meeting such need.
421. **Care and Maintenance of Ornamental Plants (5).** Lec. 3, Lab. 4. Pr., BY 306, 309 and junior standing.  
Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
422. **Floricultural Crop Production (5).** Lec. 3, Lab. 4. Pr., HF 323 and junior standing.  
Floricultural crop production under management in greenhouse and outdoor conditions.
423. **Nursery Management (5).** Lec. 3, Lab. 4. Pr., HF 224, BY 306, AY 304 and junior standing.  
Principles and practices of the management of a commercial ornamental nursery.
424. **Planting Design (5).** Lec. 3, Lab. 4. Pr., HF 222, 223, 321 and junior standing.  
Principles and practices of the combination and use of ornamental plants in landscape plantings.
425. **Flower Shop Management (5).** Lec. 3, Lab. 4. Pr., HF 225, 422, permission of instructor.  
Principles and practices of flower shop management and floral designing.
- 426-27-28. **Minor Problems (3-5 each).** Lec. 1, Lab. 8. Pr., junior standing and permission of instructor.  
Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
429. **Advanced Plant Propagation (5).** Lec. 3, Lab. 4. Pr., HF 224, BY 306, and junior standing.  
Commercial propagation of Horticultural plants with emphasis on the physiological and anatomical principles.
430. **Marketing Horticultural Specialty Products (5).** Lec. 3, Lab. 4. Pr., HF 422, HF 423.  
Channels and methods of distribution of floricultural and nursery products.
431. **Advanced Landscape Gardening (5).** Lec. 3, Lab. 4. Pr., BY 101, HF 221, graduate standing.  
Principles and practices applying to the use of ornamental plant material in landscaping. (Selected portions of this course may be offered as a 3 hour credit in the Master of Agriculture program.)
432. **Controlled Plant Growth (5).** Lec. 3, Lab. 4. Pr., AY 304, BY 306, CH 207, CH 208, HF 323, and junior standing.  
Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.

### General Horticulture

101. **Introduction to Horticulture (1).** Lec. 1.  
An orientation course for freshmen introducing all fields in Horticulture.



201. **Orchard Management (5). Lec. 3, Lab. 4. Each quarter.**  
 Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
308. **Vegetable Crops (5). Lec. 3, Lab. 4. Each quarter.**  
 Principles and special practices used in production of vegetable crops.
340. **Industrial Food Preservation Technology (5). Lec. 3, Lab. 4. Fall. Pr., junior standing or consent of instructor.**  
 Principles of food preservation as applied to industry. Processes considered include re-fermentation, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
341. **Industrial Food Equipment and Processes I (5). Lec. 3, Lab. 4. Winter. Pr., junior standing or consent of instructor.**  
 Material and structural requirements of food equipment, and basic principles and processes such as heat exchange, refrigeration, evaporation, distillation, homogenization, extraction, filtration, centrifugation, fluid flow and instrumentation.
342. **Industrial Food Equipment and Processes II (5). Lec. 3, Lab. 4. Spring. Pr., junior standing or consent of instructor.**  
 Continuation of subject matter of HF 341 with emphasis on unit operations and processes.
343. **Food Analysis and Quality Control (5). Lec. 3, Lab. 4. Fall. Pr., CH 208.**  
 Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.
401. **Commercial Vegetable Crops (3). Lec. 2, Lab. 2. Winter. Pr., HF 308 and junior standing.**  
 An advanced course in the production of the major commercial vegetable crops.
402. **Storage, Packaging and Marketing of Vegetable Crops (3). Lec. 2, Lab. 2. Spring. Pr., junior standing.**  
 Physiological, pathological, and horticultural principles in storing, packaging, and marketing of commercial vegetable crops.
404. **Fruit Growing (5). Lec. 4, Lab. 2. Winter. Pr., HF 201 and junior standing.**  
 Production and marketing of commercial tree fruits grown in the South.
405. **Small Fruits (5). Lec. 4, Lab. 2. Spring. Pr., HF 201 and junior standing.**  
 Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
406. **Nut Culture (5). Lec. 4, Lab. 2. Fall and Winter. Pr., HF 201 and junior standing.**  
 Production and marketing of pecans, walnuts, chestnuts, tung, and filberts.
408. **Commercial Vegetable Crops (3). Lec-Lab. 4. Spring or Summer. Pr., HF 308 and graduate standing.**  
 Application of research information to the commercial production and handling of the principal vegetable crops. (Credit for both HF 408 and 401 may not be used to meet requirements for the Master's degree.)
410. **Recent Advances in Small Fruits (3). Spring and Summer. Pr., HF 201 and graduate standing.**  
 Scientific advances in small fruits and their application to small fruit culture in Alabama. (Credit for both HF 410 and HF 405 may not be used to meet requirements for the Master's degree.)
- 426-27-28. **Minor Problems (3-5 each). Lec. 1, Lab. 8. Pr., junior standing and permission of instructor.**  
 Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
440. **Food Engineering (5). Lec. 3, Lab. 4. Winter, even years. Pr., junior standing.**  
 Application of physics and engineering principles to food processing operation, instrumentation in food processing, process and equipment development.

## GRADUATE COURSES

601. **Experimental Methods in Horticulture (5). Lec. 3, Lab. 6. Any quarter.**  
 Purposes of research, discovery, and progress as related to the scientific method; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
602. **Seminar (1). Fall, winter, and spring. May be taken more than once for a maximum of three hours credit.**
603. **Special Problems in Horticulture (3-5). Credit to be arranged. All quarters. Pr., graduate standing.**  
 Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.

604. **Plant Growth and Development (5).** Lec. 4, Lab. 2. Any quarter. Pr., HF 432 or BY 306 and consent of instructor.  
Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
605. **Nutritional Requirements of Horticultural Plants (5).** Lec. 4, Lab. 2.  
Nutritional requirements of horticulture crops and factors affecting these requirements.
606. **Physiology of Horticultural Products Following Harvest (5).** Lec. 3, Lab. 4. Winter, even years. Pr., BY 306 and graduate standing.  
Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.
607. **Breeding of Horticultural Crops (5).** Lec. 3, Lab. 4. Summer, even years. Pr., ZY 300 and graduate standing.  
An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.
699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.

### Industrial Engineering (IE)

*Head Professor Brooks*

*Professors Cobb and Denholm*

*Associate Professors Estes, Hool, Layfield, Mize,*

*Morgan, Rainer, and White*

*Assistant Professors Boyd\*, Herring, Smith, and Trucks\*\**

201. **Industrial Administration (3).** Pr., sophomore standing.  
The concepts, techniques, and functions of engineering management. (Not open to Industrial Engineering students.)
202. **Industrial Processes (3).** Pr., EG 106, IL 100, PS 220, CH 103.  
The general processes by means of which producer and consumer goods are manufactured.
204. **Computer Programming (3).** Pr., MH 162.  
Digital computer programming with emphasis on mathematical problems, using FORTRAN programming language. (Not open to students with credit in IE 205.)
205. **Computer Programming and Introduction to Information-Decision Systems (3).** Lec. 2, Lab. 3. Pr., MH 265 (or concurrently).  
Digital computer programming with emphasis on mathematical and engineering problems using FORTRAN programming language. Included are introductory design considerations for information-decision systems involving computers as a principle data processing device. (Intended for engineering students and not open to students with credit in IE 204.)
211. **Engineering Statistics I (3).** Pr., MH 264.  
Basic probability, random variables, distribution functions and confidence intervals.
301. **Electronic Data Processing and Computer Programming (5).** Lec. 4, Lab. 3. Pr., junior standing.  
Functions and uses of electronic data processing equipment, and an introduction to digital computer programming with emphasis on administrative problems, using COBOL programming language.
302. **Production Control Techniques (3).** Pr., IE 201, or EC 300.  
Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control. (Not open to Industrial Engineering students.)
305. **Information-Decision Systems (3).** Lec. 2, Lab. 3. Pr., IE 205.  
Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
310. **Motion and Time Study (5).** Lec. 4, Lab. 3. Pr., EC 274.  
Principles and practices of methods engineering and time study. (Not open to students with credit in IE 318 or IE 419.)
312. **Engineering Statistics II (3).** Pr., IE 211.  
Tests of hypothesis, regression techniques and engineering applications.
313. **Engineering Statistics III (3).** Lec. 1, Lab. 6. Pr., IE 312.  
Analysis of variance, considering completely randomized design, one factor experiment and associated topics. A statistically oriented design project will illustrate methods from IE 211 and IE 312.

\*Temporary.

\*\*On study leave to September 1, 1970.

314. **Operational Analysis I (3).** Pr., IE 202, IE 312, IE 325.  
Nature of operational systems analysis; decision theory; formulation of objective; identification of alternatives; concept of systems analysis (system description); model building; concept of optimization; introduction to model solution methods.
315. **Operational Analysis II (3).** Pr., IE 205, IE 314, MH 266.  
Introduction to mathematical programming methods with emphasis on linear models. Graphical, vector and simplex methods of solution are presented. Transportation and allocation models included.
316. **Electronic Data Processing Systems (4).** Lec. 3, Lab. 3. Pr., IE 204, IE 301, or IE 305.  
Application of computers and associated data processing equipment to business and administrative information and decision systems.
318. **Work Design I (3).** Lec. 2, Lab. 3. Pr., IE 314.  
Study and practice in applying principles which govern motion economy; work space organization; selection of materials, jigs, fixtures, and equipment, and application of methods time measurement for the determination of the most economical method of manufacture. (Not open to students with credit in IE 310.)
320. **Engineering Economy (5).** Pr., MH 161 and junior standing.  
Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 325 or IE 326.)
325. **Engineering Economic Analysis I (3).** Pr., IE 205, MH 265.  
The development of principles required in engineering economy studies and other decision-making oriented courses. (Not open to students with credit in IE 320.)
326. **Engineering Economic Analysis II (3).** Pr., IE 314 and junior standing.  
Engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 320.)
363. **Man-Machine Systems I (3).** Pr., PG 320, IE 312.  
Human engineering and human beings' relation to machine systems; human characteristics in view of performance of functions where machines are involved, and design for man-machine systems.
414. **Engineering Statistics IV (3).** Pr., IE 313.  
Emphasis on statistical methods of controlling quality in manufacturing.
416. **Operational Analysis III (3).** Pr., IE 305, IE 313, IE 314.  
Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
417. **Operational Analysis IV (3).** Pr., IE 315, IE 416.  
Game theory; queueing theory; non-deterministic inventory models; replacement models; sequencing and scheduling models. Application to operational systems analysis.
419. **Work Design II (3).** Lec. 2, Lab. 3. Pr., IE 318, IE 363.  
Principles governing the establishment of standard data in the various forms required for methods time measurement, wage incentive organizations, budgetary planning and standard cost; and the use of time measuring equipment in problems of standard data determination. (Not open to students with credit in IE 310.)
420. **Materials Handling (5).** Lec. 4, Lab. 3. Pr., IE 310.  
Materials handling equipment, methods, and systems. (Not open to Industrial Engineering students.)
424. **Production Control Functions (3).** Pr., IE 326, IE 419.  
Functions of production control; forecasting; production planning; inventory analysis; scheduling; dispatching and progress control. Critical path planning methods.
426. **Industrial Budget Control (3).** Lec. 2, Lab. 3. Pr., IE 305.  
Industrial control through budgets and the inter-relationships between organizations, management and budgets.
427. **Operations and Facilities Design I (3).** Lec. 2, Lab. 3. Pr., IE 326.  
Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)
428. **Operations and Facilities Design II (3).** Lab. 9. Pr., IE 417, IE 424, IE 427.  
The design of industrial, institutional governmental and service operations and facilities. (Should be taken during student's final quarter.)
429. **Operational Control System Design (3).** Pr., IE 414, IE 417, IE 424, IE 426.  
The design of operational planning and control systems. Integration of individual system functions. Concept of total system optimization.
430. **Contracts and Specifications (3).** Pr., senior standing.  
Contract documents; specification writing; professional relations.
432. **Plant Maintenance (3).** Pr., IE 201.  
Principles of organizing and controlling maintenance operations in industrial plants. (Not open to Industrial Engineering students.)

434. **Sales Engineering (3). Pr., IE 201, junior standing.**  
Application of appropriate principles and techniques to selling industrial products when a background knowledge of production is required. (Not open to Industrial Engineering students.)
436. **Plant Location (3). Pr., IE 315, IE 326, IE 417.**  
Factors and techniques pertinent to the economic location of industrial plants.
438. **Safety Engineering (3). Pr., IE 201, junior standing.**  
Principles, practices, organizations and procedures for industrial accident prevention and plant protection. (Not open to Industrial Engineering students.)
- 490-1-2. **Industrial Engineering Problems (1-5). Pr., permission of instructor and department head approval.**  
Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

### Advanced Undergraduate and Graduate Courses

440. **Sampling and Survey Techniques (3). Pr., IE 312, IE 441, and junior standing.**  
Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.
441. **Applied Industrial Engineering Mathematics (3). Pr., IE 315, and junior standing.**  
Matrix Algebra required for linear programming, transfer theory needed for the study of systems, numerical methods of solving these problems.
442. **Advanced Linear Programming (3). Pr., IE 441, and junior standing.**  
Continuation of IE 315 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.
443. **Inventory Control (3). Pr., IE 414, IE 417, IE 424, and junior standing.**  
Application of quantitative methods to the control of industrial inventories.
458. **Reliability Engineering (3). Pr., IE 414, IE 417, and junior standing.**  
Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
464. **Man-Machine Systems II (3). Pr., IE 363 and junior standing.**  
A continuation of the prerequisite course, IE 363.
470. **Project Management (3). Pr., IE 417, or permission of instructor and junior standing.**  
Project management and development with primary emphasis on use of operations research methods and cost analysis. Includes a study of the application of CPM and PERT to project management.
471. **Product Flow Analysis (3). Pr., IE 416, IE 417, and junior standing.**  
Application of operations research methods to problems in materials handling. General materials handling problems, analysis of fixed schedule systems, random flow systems, waiting lines, conveyors, and the use of simulation methods.
472. **Engineering of Organization and Management (3). Pr., IE 426, and senior standing.**  
Organizational theory and concepts; the interaction between the individual and the organization.
480. **Automation (5). Pr., junior standing and consent of instructor.**  
History, development, and state of automation in business. Business data processing and the resulting implications in management practices and research. (Not for science and mathematics students.)

### GRADUATE COURSES

616. **Industrial Dynamics (3). Pr., IE 416 or permission of instructor.**  
Industrial dynamics based on a systems approach to industrial and related economic problems, with emphasis on decision-making.
617. **Advanced Simulation Problems (3). Pr., IE 416 or permission of instructor.**  
Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
623. **Introduction to Stochastic Processes (3). Pr., IE 417, IE 441.**  
Markov Chains, life and birth processes, random walk, and queueing theory and applications will be studied.
624. **Inventory and Production Control Systems (3). Pr., IE 429, IE 443.**  
Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
630. **Advanced Statistical Methods for Engineers I (3). Pr., IE 312, IE 441.**  
Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression procedures.

631. **Advanced Statistical Methods for Engineers II (3). Pr., IE 630.**  
Extension of IE 630, with primary emphasis on analysis of variance methods. Includes a theoretical study of analysis of variance methods, mathematical derivation of mean squares, multiple comparison tests, and the Bennett and Franklin algorithm.
632. **Advanced Statistical Methods for Engineers III (3). Pr., IE 631.**  
The philosophy and methods of statistical design optimization, with emphasis on optimum multiple linear regression designs, optimum analysis of variance designs, and an introduction to response surface analysis.
633. **Dynamic Programming (3). Pr., IE 417, IE 441.**  
Theory of dynamic programming, a study of some general dynamic programming methods, and a case study of applications.
634. **Non-Linear Programming (3). Pr., IE 442.**  
Quadratic Programming, Separable Programming, Gradient Methods, and Integer Programming.
664. **Management Information Decision Systems (3). Pr., IE 441 or permission of instructor.**  
Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
665. **Advanced Behavioral Engineering (3). Pr., IE 464 or permission of instructor.**  
Advanced topics in man-machine relationships, stimulus-response studies, and learning theory.
670. **Advanced Computation Methods (3). Pr., permission of the instructor.**  
Advanced computer languages, pattern recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
- 690-1-2. **Industrial Engineering Projects (1-3). Pr., permission of instructor.**  
Special topics which the students desire to investigate under supervision of the graduate staff.
699. **Thesis (0-7).**

### Industrial Laboratories (IL)

*Professor Haynes*

*Assistant Professors Goolsby, McMurtry, and Wingard*

*Instructor Connor*

Courses listed below are available as electives to all students with the necessary prerequisites.

100. **Introduction to Manufacturing Processes (3). Lab. 6.**  
Laboratory oriented studies in economic production principles related to metal and plastic product manufacturing.
102. **Welding Science and Application (1). Lab. 3.**  
Basic principles and application of welding and cutting processes in the fabrication of metals.
103. **Machine Tool Laboratory (1). Lab. 3.**  
Introduction to metal removal processes; basic machines of production.
104. **Sheet Metal Design and Fabrication (1). Lab. 3.**  
Methods and equipment used in design, production and fabricating of sheet metal products.
105. **Foundry Technology (1). Lab. 3.**  
Basic fundamentals involved in casting products of ferrous and non-ferrous metals.
308. **Gages and Measurements (5). Lec. 4, Lab. 2. Pr., IL 103.**  
The science of measurement as applied to production and inspection of industrial products.

### Manufacturing Processes

Courses designed to acquaint the student with basic manufacturing processes including analysis of machines, tools, material product design, and dimensional control.

301. **Manufacturing Processes—Casting area (3). Lec. 3. Pr., any one shop course.**  
Analysis of materials, methods, and design of cast products.
302. **Manufacturing Processes—Machining area (3). Lec. 3. Pr., IL 103.**  
Principles of machining metal products.
303. **Manufacturing Processes—Shaping, Forming, and Fabricating area (3). Lec. 3. Pr., IL 102.**  
Materials and methods involved in the production of metal products by shaping, forming, and welding processes.

304. **Materials in Design Engineering (3). Lec. 3.**  
Acquaints the student with methods of material selection for product development.
310. **Dimensional Control (4). Lec. 3, Lab. 2. Pr., IL 103.**  
Fundamentals of Measurement Science with Laboratory Exercises in Dimensional Control.
405. **Problems in Welding Engineering (5). Lec. 3, Lab. 4. Pr., IL 102.**  
Advanced phases and techniques of welding and allied processes. Students in design, weldability of metals, inspection practice, and selection of equipment.
406. **Problems in Machining (5). Lec. 3, Lab. 4. Pr., IL 103.**  
Advanced phases of metal machining with emphasis on production machines and accessories.
450. **Engineering Metrology (1-5). Pr., junior standing and departmental approval.**  
Studies in design, construction and use of precision measuring equipment and gages.

Courses designed chiefly for the preparation of teachers in Industrial Arts subjects and related fields.

101. **Woodworking (1). Lab. 3.**  
Introduction to machines, tools, and materials used in working with wood and plastic.
307. **General Metals (5). Lec. 3, Lab. 4. Pr., consent of instructor.**  
Design, construction and finishing art metal projects.
402. **Advanced Woodworking (5). Lec. 3, Lab. 4. Pr., IL 101.**  
Studies in design, construction, and finishing fine objects of wood.
403. **General Shops (5). Lec. 5. Pr., senior standing.**  
Problems of organization of unit shops into integrated whole for effective use in high school teaching.
415. **Shop Work for Elementary Teachers (5). Lec. 2, Lab. 6. Pr., junior standing.**  
Methods, materials, and techniques involved in conducting activity programs in schools and recreational centers.
416. **Materials of Industrial Arts (5). Lec. 5. Pr., senior standing.**  
History and use of various materials used in industry.
417. **Organization of Shop Courses (5). Lec. 5. Pr., senior standing.**  
Organization and administration of the Industrial Arts program in the public schools.
418. **Industrial Arts Design (5). Pr., senior standing.**  
Fundamentals of design as applied to Industrial Arts projects.
419. **Utilization of Machine Tools in Research and Development (1). Lab. 3.**  
Instruction in the use of machine tools for machining, fabricating and finishing components and assemblies of working models for developmental projects.

#### GRADUATE COURSES

- 611-12. **Technical Problems in Industrial Arts (5-5). Pr., graduate standing.**  
Advanced study of technology and method in selected areas of Industrial Arts.

### Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis. The subheadings reflect the nature and scope of the offerings.

#### Curriculum and Teaching — Elementary-Secondary

##### Teaching, Program, and Student Teaching

Students in either secondary or elementary education pursuing a curriculum leading to certification for teaching in a particular subject-matter field in elementary and secondary schools will take the Teaching and the Program courses in the teaching field in which certification is expected. These courses may be scheduled and taught as separate courses, related courses, or as a unified program.

414. **Teaching in Elementary and Secondary Schools (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**  
(A) Art, (C) Dramatic Arts, (J) Music, (M) Speech, (N) Speech Correction.
423. **Program in Elementary and Secondary Schools (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**  
(A) Art, (C) Dramatic Arts, (J) Music, (M) Speech, (N) Speech Correction.



475. Professional Internship in Elementary and Secondary Schools (15). Pr., Sr. standing. Admission to Teacher Education three quarters prior to Internship, minimum of two appropriate Teaching and Program Courses.  
(For description, see Professional Internship under School of Education.) (A) Art, (C) Dramatic Arts, (I) Mental Retardation, (J) Music, (M) Speech, (N) Speech Correction.
479. Methods and Materials for Teaching the Mentally Retarded (5). Pr., IED 476, IED 478, FED 320.

### Graduate

Courses 651, 652, 653, or 654, apply to the following areas of the school program: (A) Art, (C) Theatre, (E) Gifted, (I) Mental Retardation, (J) Music, (M) Speech, and (N) Speech Correction.

648. Advanced Study of Curriculum and Teaching (5). Pr., FED 647 or consent of departmental chairman.  
Major issues, frontier developments, and trends in the improvement of curriculum and teaching in elementary and secondary schools.
651. Research Studies in Education in Areas of Specialization (5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. Curriculum and Teaching in Areas of Specialization (5). Pr., 18 hours of appropriate subject matter and 36 hours of Psychology and professional education.  
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. Organization of Program in Areas of Specialization (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Advanced course. Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. Evaluation of Program in Areas of Specialization (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.  
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization with the total school program and with other educational programs of the community.
658. Seminar and Independent Study in Curriculum and Teaching (5). Pr., FED 647 and IED 648.  
Research and experimentation in elementary and secondary schools in the development of education programs and the improvement of teaching and learning. Appraisal of significant curriculum research, exploration of areas of needed research in curriculum and instruction, and study of fundamental criteria and methods for solving curriculum problems.

## Special Education — Elementary-Secondary

### Advanced Undergraduate and Graduate

476. The Exceptional Child (5). Pr., junior standing.  
The etiology, incidence, diagnosis and philosophy of teaching the exceptional child. Special attention is given to the child who is physically or mentally handicapped and to the child who is mentally superior.
478. Nature of Mental Retardation (5). Pr., junior standing and IED 476.  
Characteristics and nature of mental retardation. Etiology, identification, and classification of retardation are investigated. Social, psychological, physical, and educational implications of mental retardation are considered.
480. Education of Children With Special Learning Disabilities (5). Pr., junior standing and admission to Teacher Education.  
Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.

### Graduate

643. Education of the Physically Handicapped (5). Pr., adequate courses in physiology and psychology.  
Characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations; and related aspects of a total program for the physically handicapped.

650. **Teaching the Mentally Retarded (5).** Pr., IED 476, IED 478 and IED 479.  
Observation and participation under supervision in educational programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
670. **Educational Procedures for Children With Behavior Disorders (5).** Pr., Graduate standing and consent of instructor.  
Analysis of current provisions for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.
671. **Current Research on the Behavioral Disorders of Children (5).** Pr., Graduate Standing and consent of instructor.  
Examination and interpretation of research. Emphasis on educational implications of emotional conflict, classroom guidance and control.

## School Library Science — Elementary-Secondary

### Advanced Undergraduate and Graduate

472. **Books and Related Materials for Children (4).** Pr., junior standing.  
Examination and evaluation of printed and other types of materials in view of their relevance to the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.
482. **Organization and Administration of School Libraries (5).** Pr., junior standing.  
Basic organization of books, non-book materials, and services for effective use in school libraries. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of library materials are considered.
484. **Classification and Cataloging of School Library Materials (5).** Pr., junior standing.  
Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification, Wilson and Library of Congress printed cards, and subject headings are studied.
486. **Books and Related Materials for Young People (5).** Pr., junior standing.  
Study and evaluation of books and other types of materials in relation to the interests, needs, and abilities of young people of high school age. Attention is given to selection aids, principles and criteria of selection, reading guidance, and significant investigations concerning young people's reading.
487. **Practicum in School Library Services (4-6).** Lec. 2, Lab. 4-8. Pr., junior standing.  
Provides students with information pertaining to methods used in the operation of libraries in elementary and secondary schools.

### Graduate

610. **Reference Materials and Service (5).** Pr., 10 hours in library science at the 400 level.  
Study and evaluation of basic reference sources for effective reference service in school libraries. Elementary research methods of locating information and the role of various types of reference books as resource material in curricular units are considered.
611. **Principles of School Librarianship (5).** Pr., 10 hours in school library science at the 400 level.  
Place and function of library service in the American educational system. Historical development of libraries; library services to teachers and pupils as an integral part of the school program; standards and administrative policies are included.
612. **Problems in the Administration of the School Library Services (5).** Pr., 10 hours in school library science at the 400 level.  
Current problems relating to an effective program of school library service.
613. **Library Services in the School and Community (5).** Pr., 10 hours in library science at the 400 level.  
School library-community relations; historical background, current trends; problems and programs of service; relation to public and rural library extension service; selection of materials on the basis of community and curriculum needs; book lists and exhibits.

## Higher Education

### Graduate

The courses described below along with AED 618 and AED 697 are designed especially for advanced students who are interested in positions in colleges, universities, and other post secondary-school institutions.

663. **The American College and University (5).**  
Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships; international flow of educational ideas, government cultural programs, higher education and the state.
665. **The Community College (5).**  
The rise and development of the community or junior college in American education. Includes organization, curriculum construction, staffing, and instructional procedures.
798. **Research and Thesis (5).**
799. **Doctoral Research and Dissertation. (Credit to be arranged.)**

### Journalism (JM)

*Professor Burnett*

*Instructor Logue*

English 101-2 or 103-4 is a prerequisite for all courses in journalism.

221. **Beginning Newswriting (5).**  
Introduction to newswriting, newspaper style, and mechanical practice, supplemented by work on the college newspaper.
223. **Reporting (5). Pr., JM 221.**  
The technical aspects of reporting and newsgathering methods, supplemented by work on the college newspaper.
224. **Copyreading and Editing (5). Pr., JM 221.**  
Methods of editing copy, writing headlines, basic make-up and proof reading.
315. **Agricultural Journalism (3).**  
Designed for students in agriculture and home economics. Introduces practices of news coverage and writing, with major emphasis on specialized fields of study.
322. **Feature Writing (5). Pr., JM 221 or permission of the instructor.**  
Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.
323. **The Weekly Newspaper (5). Pr., JM 221.**  
Methods, problems, and policies involved in editing the weekly newspaper, as differing from the metropolitan daily.
421. **Photo-Journalism (5).**  
Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422.3. **Journalism Workshop (3-3). All quarters. Pr., 15 hours of journalism, including JM 221 and 223.**  
A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work with University communication media.
425. **Journalism Internship (6). Summer. Pr., JM 221, 223, 224, and consent of instructor.**  
A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
465. **The History and Principles of Journalism (5).**  
The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.

### GRADUATE COURSES

605. **Agricultural Newswriting (3). Lec. 4. Pr., 20 hours of Journalism or consent of instructor.**  
Methods and problems of writing agricultural and home economics news, feature articles, and columns for publication. Special attention is given to improving communication of effectiveness between the specialist and the public.

### Laboratory Technology (LT)

*Instructor Wheatley*

*Special Lecturer in Medical Technology F. B. Schultz, M.D.*

101. **Orientation (1). Fall and Winter quarters.**  
Aims, objectives, and requirements for careers in Medical and Laboratory Technology.
301. **Hematology (5). Lec. 3, Lab. 6.**  
Study, procedures, and examinations of the blood, as recommended by the American Society of Clinical Pathologists.
305. **Serology (5). Lec. 2, Lab. 6. Pr., VM 204.**  
Theory and techniques of laboratory tests based on the antigen-antibody reaction.

401. **Advanced Hematology (5).** Lec. 3, Lab. 6. Pr., LT 301.  
Advanced study of blood cells and blood dyscrasias.
402. **Seminar in Laboratory Technology (3).** Pr., LT 301.  
The student reports from the literature on recent advances in the field of laboratory technology.
405. **Advanced Serology (5).** Lec. 2, Lab. 6. Pr., LT 305.  
Theory and techniques of the serological study of human blood.
422. **Hospital Laboratory Practice (5).** Lab. 15. Pr., LT 301.  
Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.

### Library (LY)

101. **Use of the Library (1).**  
Lectures and assignments designed to facilitate use of the card catalog, periodical indexes and the compilation of bibliographies. Taught by library staff members. Note: School Library Science courses are listed in the Interdepartmental Education heading.

### Management (MN)

*Associate Professors Alexander, Allen, Henry, Lamar, Myles*

*Assistant Professors Bond, Bressler, Brown, Crim, Goodwin, F. O. Hale, Horn, Myers*  
*Instructors B. Andress\*, L. Andress, Little, Samford, Smith, M. Street\**

### Management

310. **Principles of Management (5).** Pr., junior standing.  
Management functions and the application of management principles in organizations.
341. **Business Law (5).** Pr., EC 200, or AS 202.  
Contracts, torts, courts and partnerships from the standpoint of the average citizen.
342. **Business Law (5).** Pr., MN 341.  
Legal principles covering sales, agency, insurance, personal property, real property, suretyship and bankruptcy presented from the standpoint of the layman.
380. **Industrial Management (5).** Pr., junior standing and MN 310.  
Principles and practices of modern scientific management as applied in the actual control and operation of industrial enterprises.
405. **Administrative Management (5).** Pr., MN 310 or MN 380, or consent of instructor, junior standing.  
Administrative organization, systems design, data collection and processing methods, communications and records management, office physical facilities, office performance standards and control, motivation of office personnel.
442. **Personnel Management (5).** Pr., MN 310 or IE 201, junior standing.  
Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
447. **Job Evaluation (3).** Pr., MN 442 or EC 445, junior standing or consent of instructor.  
Wage and salary policy and administration with emphasis on the rationalization of wage and salary structures.
448. **Incentive Methods (3).** Pr., MN 447, junior standing or consent of instructor.  
Methods and associated problems of providing incentives for workers and management personnel in industry and business.
449. **Advanced Personnel Management (5).** Pr., MN 442 or PG 461, and junior standing.  
The solution of selected subjects or problems which confront personnel managers and related supervisory personnel.
455. **Government and Business (5).** Pr., junior standing and EC 202.  
The regulation and control of business by government with emphasis upon the legislation dealing with combinations, public utilities, transportation, and economic development.
480. **Business Policies and Administration (5).** Pr., junior standing or consent of instructor and EC 202 or MN 310.  
The formulation and application of policies and programs pertaining to personnel, production, finance, procurement and sales in the business enterprise.

### GRADUATE COURSES

606. **Management Problems (5).** Pr., MN 480 or permission of instructor.  
Basic administrative problems in business and industry. Managerial controls as applied to administrative and operative functions.

\*Temporary.

607. **Managerial Economics (5).** Pr., EC 202, graduate standing or consent of instructor.  
Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions, competition and equilibrium for the firm and the industry.
696. **Readings in Production and Personnel Management (1-10).**  
General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.

### Office Administration

200. **Typewriting I (3).** Lab. 5.  
Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with high school typewriting receive no credit.)
201. **Typewriting II (3).** Lab. 5. Pr., MN 200 with grade of C or one year of high school typewriting.  
Emphasis on business letters and forms; tabulation; reports.
202. **Typewriting III (3).** Lab. 5. Pr., MN 201 with grade of C.  
Advanced typewritten communications with special problems and arrangement. (Students with two years of high school typewriting consult with OA staff about placement.)
203. **Typewriting IV (2).** Lab. 3.  
Statistical typewriting; composition at the typewriter; executive office projects.
210. **Shorthand I (5).** Pr., MN 200 or equivalent.  
Principles of Gregg shorthand, DJS. Rapid reading of shorthand; introduction of dictation techniques. For student with no previous training in shorthand. Students with one year of high school shorthand begin with second course.
211. **Shorthand II (5).** Pr., MN 210 with grade of C or equivalent.  
Continuation of Shorthand I; dictation and development of pretranscription skills. Students with two years of high school shorthand begin with third course.
212. **Shorthand III (5).** Pr., MN 211 with grade of C.  
Continuation of Shorthand II with emphasis on dictation speed and development of pretranscription skills.
300. **Transcription I (5).** Lab. 10. Pr., MN 212 with grade of C or equivalent.  
Development of transcribing skills progressing from transcription of printed shorthand to mailable transcription of unfamiliar material dictated at progressively higher rates of speed. Continuation of shorthand speed building 100 to 120 wpm.
301. **Transcription II (5).** Lab. 10. Pr., MN 300 with grade of C.  
Terminal course. Emphasis on high quality transcripts evaluated according to transcription rate and speed of dictation. Shorthand speed 120 to 140 wpm.
305. **Records Management (3).** Pr., junior standing.  
Basic procedures of filing, records storage and control. Practice in record keeping.
400. **Office Machines (5).** Lab. 10. Pr., junior standing or consent of instructor and ability to type at reasonable speed.  
Designed to give a working knowledge of various machines found in modern offices. Basic training in use of dictating and transcribing, duplication, adding, calculating, and posting machines.
402. **Office Apprenticeship (5).** Lab. 10. Pr., MN 301, MN 403 or MN 404, and junior standing.  
Practical secretarial experience. Student spends two hours each day working as intern in an office to which assigned for actual office experience.
403. **Secretarial Procedure I (5).** Pr., MN 300 and junior standing.  
Analysis of the secretarial profession stressing importance of personal factors, development of decision-making ability, study of specialized duties including those of public relations.
404. **Secretarial Procedure II (5).** Pr., MN 300 and junior standing.  
Continuation of Secretarial Procedure I with study of important areas of preparation for the prospective administrative assistant, including preparation of reports using basic knowledge of data processing and statistics, financial and legal duties, and duties of supervision. Case studies.

### Marketing and Transportation (MT)

*Professor Horton*

*Associate Professor Henley*

*Instructors Baird, Harris, McHaney, Miller*

331. **Principles of Marketing (5).** Pr., EC 202.  
A general but critical survey of the field of marketing covering marketing channels, functions, methods and institutions.

**332. Credits and Collections (5). Pr., EC 200, junior standing.**

The nature and functions of credit, credit investments, credit information, mercantile and installment credit, credit department, organization and management, collection methods, credit insurance, etc.

**333. Salesmanship (3). Pr., junior standing.**

The principles and problems in personal selling covering the various steps involved in the selling process. Consideration is also given to the economics of selling and to material useful to salesmen but outside the field of selling techniques.

**432. Advertising (3). Pr., MT 331, junior standing.**

The principles and practices involved in advertising. Analysis of the need for advertising. Preliminary product and market analyses, budget considerations, technical preparation and testing, planning campaigns, media selection, and coordination of the entire program.

**433. Retail Store Management (5). Pr., MT 331, junior standing.**

Principles and practices involved in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.

**434. Purchasing (5). Pr., MT 331, junior standing.**

Objectives, control, and the direction of industrial purchasing.

**435. Marketing Problems (5). Pr., MT 331, junior standing.**

Marketing problems, policies, costs, channels of distribution, terminal markets, trade barriers and legislation.

**436. Marketing Research Methods (5). Pr., MT 331, junior standing.**

Methods of scientific research in the field of marketing and their application to the solution of marketing problems.

**437. Sales Management (5). Pr., MT 331, MN 310, junior standing.**

Principles and practices of sound organization and administration of sales organization. Includes consideration of: sales department organization, selecting, training, compensating, and supervising salesmen, sales planning, setting up sales territories and quotas and other problems.

**438. Retail Merchandising (5). Pr., MT 433 and junior standing.**

The planning, policies, procedures, and techniques necessary to insure a balanced assortment of merchandise consistent with customer demand and profitable operation.

**472. Economics of Transportation (5). Pr., EC 200, junior standing.**

The development of systems of transportation. Rates are studied as they affect agriculture, commerce and industry. Attention is also given to government regulation of transportation agencies.

**473. Traffic Management (5). Pr., junior standing, MT 472 or instructor's approval.**

Fundamentals of traffic control in the transportation operations of business and industrial concerns.

**476. Motor Transportation (5). Pr., EC 200, junior standing.**

Economics of the motor transportation business with emphasis on freight and passenger carriers and the highway system. Particularly designed for students of business and of civil engineering.

## Materials Engineering (MTL)

This curriculum is administered by the Department of Mechanical Engineering. Materials Engineering courses are listed by cooperating academic departments; refer to the description of the curriculum on pp. 149-150 for required and elective courses.

## Mathematics (MH)

*Head Professor Burton*

*Research Professor Haynsworth*

*Professors Ball, Butz, B. Fitzpatrick, P. Fitzpatrick, Ikenberry, Parker,  
Perry, E. Williams*

*Associate Professors Baskervill, Bennett, Calder, Coleman,*

*R. Ford, C. Robinson, Thompson, L. Williams*

*Research Assistant Professor Transue*

*Assistant Professors Brown, Darwin, J. Ford\*, Guenther,*

*Hinrichsen, Murrell, Reed, Sanders, Zenor*

*Instructors Bass\*, Crocker\*, Hartwig\*, Hill\*, Howard\*,*

*Hyams\*, Lauer\*, Murphy\*, Powell\*, Salzmann\*, Trimble\*, Van Cleave\*, N. Williams\**

**100. Mathematical Insights (5).**

For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Credit for any other University mathematics course precludes credit for this course.

\*Temporary.



159. **Precalculus Mathematics (5).**  
Preparation for MH 161 but not MH 162. Emphasizes algebraic techniques, coordinate geometry, functions and relations and their graphs. Students who need a precalculus foundation which emphasizes trigonometry should take MH 160.
160. **Algebra and Trigonometry (5).**  
Basic analytic and geometric properties of the algebraic and trigonometric functions. Prepares students for MH 161. Duplicate credit will not be allowed for MH 159 and MH 160.
161. **Analytic Geometry and Calculus (5).** Pr., MH 159 or MH 160.
- 162-3. **Analytic Geometry and Calculus (5-5).** Pr., MH 160 and MH 161.  
A continuation of MH 161.
- 220-21-22. **Introduction to Analysis I, II, III (5-5-5).** Pr., MH 163.  
The real number system leading to theorems concerning number sets, sequences and graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.
264. **Analytic Geometry-Calculus (5).** Pr., MH 163.  
A continuation of MH 161-2-3. Infinite series, partial derivatives, multiple integrals.
265. **Linear Differential Equations (3).** Corequisite, MH 264; or, alternately, prerequisite, MH 221.  
First and second-order linear differential equations including the solution of such equations by infinite series.
266. **Topics in Linear Algebra (3).** Pr., MH 163.  
Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 333 or MH 405 or MH 437.
- 281-2-3. **Elementary Mathematics (5-5-5).** Pr., sophomore standing.  
These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry.
- 331-32-33. **Introduction to Modern Algebra I, II, III (5-5-5).** Pr., MH 163.  
Sets, mappings, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals; factorization problems, Euclidean domains, extension, fields, vector spaces.
362. **Engineering Mathematics I (3).** Pr., MH 265.  
Fourier Series, partial differential equations, special functions.
401. **The Calculus of Vector Functions (3).** Pr., MH 266 or consent of instructor.  
Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.
403. **Engineering Mathematics II (5).** Pr., MH 265; junior standing.  
Complex numbers, functions, mappings, residues, contour integration.
405. **Matrix Theory and Applications (5).** Pr., MH 163; junior standing.  
Canonical forms, determinants, linear equations, characteristic value problems.
406. **Elementary Partial Differential Equations (5).** Pr., MH 265; junior standing.  
First and second order linear partial differential equations with emphasis on the method of eigenfunction expansions.
407. **Introduction to Celestial Mechanics (5).** Pr., consent of instructor; junior standing.  
Dynamics of a particle, two-body problem, coordinate transformations, series expansions in elliptic motion, introduction to general perturbation theory.
- 420-21-22. **Analysis I, II, III (5-5-5).** Pr., MH 264; junior standing.  
An advanced treatment of the topics of MH 220-21-22 (real number sets, sequences and graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces). Duplicate credit will not be given for corresponding courses in the MH 220-21-22 and MH 420-21-22 sequences.
428. **Linear Differential Systems (5).** Pr., MH 222 or consent of instructor; junior standing.  
Systems of linear ordinary differential equations, series solutions, approximate solutions.
431. **Modern Algebra (5).** Pr., one junior-senior level course in algebra.  
Integral domains, groups, rings, fields.
437. **Linear Algebra (5).** Pr., MH 333 or MH 431; junior standing.  
Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 441-2. **Geometry, A Modern View I, II (5-5).** Pr., MH 163; junior standing.  
A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with valid definitions and valid proofs, through the foundations of geometry and into the main body of geometric theory.

443. **Linear Geometry (5).** Pr., MH 163; junior standing.  
Transformations in projective, affine, and Euclidean planes.
444. **Combinatorial Geometry in the Plane (5).** Pr., MH 163; junior standing.  
Helly's and related theorems.
447. **Foundations of Plane Geometry (5).** Pr., MH 163; junior standing.  
Axiomatic development of a plane geometry. Points, lines, congruences. Emphasis is placed on development of proofs by students.
- 450-1. **Metric Spaces (3-3).** Pr., MH 221 or consent of instructor; junior standing.  
The elementary properties of metric spaces with special attention to the line and the plane.
460. **Introduction to Numerical Analysis (5).** Pr., MH 265 or MH 428, junior standing; a knowledge of an algorithmic computer language available at the Computer Center.†  
Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems) error analysis.
461. **Numerical Matrix Analysis (5).** Pr., MH 266 or MH 353; junior standing; a knowledge of an algorithmic computer language available at the Computer Center.†  
Numerical solution of algebraic equations and of systems of linear equations, solution of boundary value problems, numerical calculation of characteristic values and vectors, error analysis.
464. **Probability Theory (5).** Pr., MH 420 or MH 221 or consent of instructor; junior standing.  
Complete probability fields, probability functions, random variables, convergent sequences of random variables, conditional probability, distribution functions, various applications.
467. **Mathematical Statistics I (5).** Pr., MH 163; junior standing.  
Descriptive statistics, elementary probability and sampling theory, least squares and correlation.
468. **Mathematical Statistics II (5).** Pr., MH 467; junior standing.  
Chi-square test, best estimates, small sample theory, analysis of variance, non-parametric methods.
- \*480. **Mathematics of Computation (5).** Pr., MH 162; junior standing.  
Various numerical methods of problem solution; programming these methods using an algebraic compiler.
- \*485. **Fundamentals of Algebra I (5).** Pr., MH 162; junior standing.  
The structure of the integers, factorization of the integers, congruent theory.
- \*486. **Foundation of Geometry (5).** Pr., MH 162; junior standing.  
Euclidean and non-Euclidean geometries with emphasis given to their logical development from basic assumptions. Some attention given to the history of geometry.
- \*487. **Fundamentals of Analysis (5).** Pr., MH 162; junior standing.  
A study of mathematical analysis with emphasis on basic principles and relationships. (Not for majors in science and mathematics.)
491. **Special Problems (1-5).** Pr., consent of instructor; junior standing.  
Not open to graduate students. An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

#### GRADUATE COURSES

- 602-3. **Celestial Mechanics I, II, III (5-5).** Pr., MH 407 or consent of instructor.  
Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-8-9. **Applied Mathematics I, II, III (5-5-5).** Pr., approved graduate standing.  
Scalar, vector, and dyadic fields; equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
610. **Special Functions (5).** Pr., consent of instructor.
613. **Tensor Analysis (5).** Pr., consent of instructor.
- 620-21. **Functions of Real Variables I, II (5-5).** Pr., departmental approval.  
Measure theory and Lebesgue Integration.
- 622-23. **Functions of a Complex Variable I, II (5-5).** Pr., departmental approval.  
Complex numbers; analytic functions; derivatives, Cauchy integral theorem and formula; Taylor and Laurent series; analytic continuation; residues; maximum principle; Riemann surfaces; conformal mapping; families of analytic functions.

†This information can be obtained by taking IE 204.

\*Not available to graduate students in the areas of science or mathematics.

- 624-5-6. **Normed Linear Spaces (5-5-5).** Pr., departmental approval.  
Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operators, self adjoint operators, spectral theory, applications to particular spaces.
- 628-29. **Advanced Theory of Differential Equations (5-5).** Pr., departmental approval.  
Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 631-32. **Modern Algebra I, II (5-5).** Pr., departmental approval.  
Numbers; sets; groups; rings; fields of polynomials; Galois theory.
633. **Theory of Groups (5).** Pr., MH 631.  
Sylow theory, abelian groups, chain conditions.
634. **Theory of Rings (5).** Pr., MH 631.  
Structure of rings, ideals in commutative rings.
- 637-8-9. **Matrices (5).** Pr., MH 437.  
Special types of matrices; reduction to canonical form; function of matrices; readings in current literature.
- 640-41-42. **Functional Analysis (5-5-5).** Pr., MH 626 or consent of instructor.  
Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 645-46. **Differential Geometry I, II (5-5).** Pr., departmental approval.  
Tensor analysis; curves and surfaces in Euclidean space; introduction to Riemannian geometry of  $n$ -dimensions.
- 650-51-52. **General Topology (5-5-5).** Pr., consent of instructor.  
An axiomatic development of point-set topology; connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
653. **Dimension Theory (5).** Pr., consent of instructor.  
The topological study of dimension in separable metric spaces.
- 654-55. **Point Set Topology (5-5).** Pr., MH 652.  
Upper semi-continuous collections, indecomposable continua, metrization problems, other topics.
- 657-8. **Algebraic Topology (5-5).** Pr., consent of instructor.  
The fundamental group, homology and cohomology groups, simplicial complexes, other topics.
661. **Advanced Numerical Analysis (5).** Pr., MH 461, and MH 265 or MH 428.  
Numerical solution of partial differential equations.
662. **Continued Fractions (5).** Pr., MH 403 or MH 622.  
The analytic theory of continued fractions with applications to numerical analysis.
667. **Mathematical Statistics II (5).** Pr., MH 468 or consent of instructor.  
Advanced probability and sampling theory, advanced regression and correlation, analysis of variance, Monte Carlo method, factor analysis.
668. **Mathematical Statistics III (5).** Pr., MH 667.  
Estimation, experimental design, non-parametric methods, sequential analysis, game theory, linear programming, covariance techniques.

Note: Courses 683 through 688 listed below are for Education majors and are not available to graduate students in science or mathematics. They are offered in summer only.

683. **Number Systems (5).** Pr., approved graduate standing.  
Detailed construction of the number system with close attention paid to the logic employed. This course is intended to furnish the high school teacher with a thorough understanding of the number system and its role in high school algebra and analysis.
685. **Fundamentals of Algebra II (5).** Pr., approved standing.  
Number fields, including the fields of rational, real and complex numbers; the algebra of polynomials over a field; factorization of polynomials; and theory of equations.
686. **Fundamentals of Algebra III (5).** Pr., MH 685.  
Continuation of MH 685.
687. **Fundamentals of Analysis II (5).** Pr., MH 487.  
Continuation of MH 487 with the introduction of more sophisticated ideas, e.g., the completeness axiom, continuity and inverse functions.
688. **Fundamentals of Analysis III (5).** Pr., MH 687.  
Continuation of MH 687.
691. **Directed Reading in Algebra (Credit to be arranged.)** Pr., 10 hours of 600 courses in the area.

- 692. Directed Reading in Analysis. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 693. Directed Reading in Applied Mathematics. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 694. Directed Reading in Geometry. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 695. Directed Reading in Topology. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 696. Directed Reading in Matrix Theory. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 697. Directed Reading in Numerical Analysis. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 699. Research and Thesis. (Credit to be arranged.) May be taken more than one quarter.
- 799. Research and Dissertation. (Credit to be arranged.)

### Mechanical Engineering (ME)

*Head Professor Vestal*

*Professor and Assistant Head Professor Jones*

*Professors Barbin, Bussell, Jemian, Lawson, Maynor, Shaw, Swinson, and Tanger*  
*Alumni Professor Vachon*

*Associate Professors Cooley\*, Fluker, Reece, Scarborough, and Smith*

*Assistant Professors Dunn, Dyer, Goodling, Harmon, Leppert, Maples, and Yu*

*Instructors Busch, Nix, Ranson, Reiter, and Terrill*

*Visiting Lecturer Touloukian*

- 202. Engineering Materials Science—Structure (3). Pr., CH 103, PS 220 or PS 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations.
- 205. Applied Mechanics—Statics (4). Coreq., MH 264 and PS 220. Resolution and composition of forces; equilibrium of force systems; friction; second moments.
- 207. Strength of Materials I (3). Pr., ME 205 and MH 264, coreq., MH 265. Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
- 210. Engineering Method (1). Coreq., PS 222. A rational approach to the solution of engineering problems, treating the relationship between analysis and experiments, including a review of basic postulates and analytical models, with applications in various areas. (Students with credit in PN 103 may not take this course for credit.)
- 301. Thermodynamics I (4). Pr., MH 264 and PS 220. Laws of thermodynamics; energy transformations; properties and relationships among properties equations of state and simple processes and cycles.
- 302. Thermodynamics II (3). Pr., ME 301. Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
- 303. Thermodynamics III (3). Pr., ME 301. Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
- 304. Engineering Materials Science—Properties (3). Pr., ME 202, ME 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials.
- 308. Computation Laboratory (2). Lec. 1, Lab. 3. Pr., MH 265. Application of analog and digital programming in Mechanical Engineering.
- 309. Materials Testing Laboratory (1). Lab. 3. Coreq., ME 316. Applications of principles in solid mechanics.
- 312. Measurements Laboratory (3). Lec. 2, Lab. 3. Pr., ME 308. The theory and practice of engineering measurements, including treatment of experimental data and the design of experiments.
- 316. Strength of Materials II (4). Pr., ME 207, coreq., ME 309. Beams; thick wall cylinders; theories of failure; energy.
- 321. Dynamics I (4). Pr., ME 205, coreq., MH 265. Kinematics of points, lines, and rigid bodies; relative motion and coordinate transformations; kinetics; conservation of energy and momentum.

322. **Dynamics II (4).** Pr., ME 321, coreq., MH 266.  
Matrix methods in kinematics; introduction to celestial mechanics; Euler's equations of motion; the inertia tensor; gyroscopic motion.
323. **Dynamics of Machines (4).** Lec. 3, Lab. 3. Pr., ME 207, ME 322.  
Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating system.
335. **Engineering Materials Science—Physical Metallurgy (4).** Lec. 3, Lab. 3. Pr., ME 304.  
Relationship between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations.
336. **Physical Analysis of Materials I (4).** Lec. 3, Lab. 3. Pr., ME 335.  
The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students.
337. **The Physical Analysis of Materials II (4).** Lec. 3, Lab. 3. Pr., ME 336.  
The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed.
338. **Phase Diagrams (4).** Lec. 3, Lab. 3. Pr., ME 335, CH 412.  
Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics.
340. **Fluid Mechanics I (3).** Pr., ME 321, ME 301 and ME 207.  
Fluid properties; dimensional analysis; fluid statics; fluid kinematics; strain rates; differential forms of conservation laws; applications to exterior and interior flows.
341. **Fluid Mechanics II (4).** Pr., ME 340, coreq., ME 302, ME 322.  
Potential theory; vorticity; stream functions; viscous flow; boundary layers; turbulent flow.
401. **Statistical Thermodynamics (3).** Pr., ME 301 or departmental approval and junior standing.  
Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
402. **Introduction to Optimal Systems (3).** Pr., ME 316, MH 266, and senior standing.  
Least squares techniques; simplest problem of Lagrange and extensions; direct methods of optimization in engineering problems.
414. **Turbomachines (4).** Pr., ME 341 or departmental approval and junior standing.  
Applications of fluid mechanics to turbomachines, such as pumps, compressors, turbines, and fluid couplings, control devices.
415. **Thermodynamics of Power Systems (4).** Pr., ME 302, ME 303, ME 341, ME 421 and junior standing.  
Design and analysis of static and dynamic thermal power systems.
420. **Thermal Systems Laboratory (2).** Lec. 1, Lab. 3. Pr., ME 312 and ME 415.  
Selected experiments on thermal systems evaluation.
421. **Heat Transfer (4).** Pr., ME 340, EE 262, MH 265 or departmental approval and junior standing.  
Fundamental principles of heat transfer by steady and unsteady conduction, thermal and luminous radiation, boiling and condensation, free and forced convection.
422. **Transport Processes (3).** Pr., ME 421 or departmental approval and junior standing.  
Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemical reacting boundary layers.
425. **Gas and Steam Turbines (4).** Pr., ME 302, ME 341, and senior standing.  
Thermodynamic theory and design of nozzles and blades for gas and steam turbines.
427. **Dynamics of Physical Systems (4).** Pr., ME 323, ME 340 and junior standing.  
Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
428. **Air Conditioning and Refrigeration (4).** Pr., ME 302, ME 421 and junior standing.  
Theory and design of heating, cooling and ventilating systems, and refrigeration systems, including cryogenics.
432. **Automatic Controls (3).** Pr., MH 265, ME 341, ME 427 and junior standing.  
Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
436. **Engineering Materials Science—Ferrous Metallurgy (3).** Pr., ME 335, and junior standing.  
Design of ferrous metals following modern theory and practice. Hardenability, alloying, deformation, and special purpose steels.

437. **Engineering Materials Science—Nonferrous Metallurgy (3).** Pr., ME 335 and junior standing.  
Design of nonferrous metals following modern theory and practice. Aluminum and copper-beryllium systems, corrosion resistant alloys, refractory metals, strengthening mechanisms, spacecraft environments.
438. **Residual Stresses in Metals (3).** Pr., ME 335, and junior standing.  
Production and measurement of residual stresses in metals; relation of residual stresses to fatigue; consideration of fatigue in design.
439. **Mechanical Engineering Design I (4).** Lec. 3, Lab. 3. Pr., ME 323; coreq., ME 335, ME 427.  
Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
440. **Mechanical Engineering Design II (3).** Lec. 2, Lab. 3. Pr., ME 439, ME 316.  
The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
443. **Photoelastic Stress and Strain Analysis (3).** Pr., ME 207 and junior standing.  
Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelectric models and analysis.
446. **Advanced Physical Metallurgy—Theoretical Metallurgy (3).** Pr., ME 335, CH 408, PS 222.  
The physical properties of metals in relation to the modern theories of metals.
447. **Advanced Physical Metallurgy—Plasticity (4).** Lec. 3, Lab. 3. Pr., ME 335, ME 316.  
The macro- and micro-processes involved in the plastic deformation of metals. Slip, twinning, dislocation theory, creep, fatigue, impact, high velocity deformation, and other plastic deformation processes will be studied in relation to current knowledge.
448. **Introduction to Ceramics (3).** Pr., ME 335.  
The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included.
450. **Special Problems. (Credit 1-5).** Pr., Department Head approval, junior standing.  
Individual student endeavor under staff supervision involving special problems of an advanced nature.
451. **Advanced Projects (3).** Lec. 1, Lab. 6. Pr., ME 421, ME 341, coreq., ME 440, and senior standing.  
Individual projects of a current nature, involving both analysis and synthesis, culminating in a formal report.

#### GRADUATE COURSES

600. **Fluid Dynamics (3).** Pr., MH 404 and graduate standing.  
Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow. Crocco's theorem. Creeping flow. Turbulence and Reynolds' Equations.
601. **Boundary Layer Theory (3).** Pr., ME 600 or CE 612.  
Hydrodynamic, thermal, mass and magnetic boundary layers. Prandtl's equations. Momentum equations. Energy equations.
602. **Gas Dynamics I (3).** Pr., ME 600 or CE 612.  
Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves; high speed flow; internal and external flows; forces on immersed bodies.
603. **Gas Dynamics II (3).** Pr., ME 600, ME 602, or consent of instructor.  
Supersonic flow theory with emphasis on applications to internal flows with and without heat transfer.
604. **Advanced Thermodynamics I (3).** Pr., ME 303 and graduate standing.  
Classical thermodynamics of reactive and nonreactive systems; applications.
605. **Advanced Thermodynamics II (3).** Pr., ME 604.  
Statistical treatment of the laws and properties of thermodynamic systems; applications.
606. **Propulsion Systems (4).** Pr., departmental approval.  
Chemical systems including liquid and solid rocket engines; thermionic engines and ionic propulsion; plasma and nuclear propulsion systems.
607. **Energy Conversion Systems (3).** Pr., ME 415 or departmental approval.  
Electromechanical energy conversion; thermoelectricity; thermionic converters; photovoltaic conversion; magnetohydrodynamic generators; fuel cells.
608. **Advanced Thermodynamics III (3).** Pr., ME 605.  
Thermodynamics of nonequilibrium processes.



612. **Engineering Analysis (3).** Pr., departmental approval.  
Equilibrium, eigenvalue, and propagation problems for continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.
615. **Experimental Research Methods (3).** Pr., departmental approval.  
Numerical methods and data processing, mathematical statistics and probability, analysis of experimental data, errors of measurement, and instrumentation.
616. **Fluid Machines (3).** Pr., ME 602.  
Similarity considerations; cavitation; cascade theory; axial and radial flow machines.
617. **Turbulence (3).** Pr., ME 600 and ME 601.  
Analysis of wall-affected and free turbulent flows.
620. **Heat Transmission—Conduction (3).** Pr., ME 421.  
Fourier's general equation, influence of heat sources and sinks, analog and numerical methods of solving heat transfer problems; heat transfer from extended surfaces, transient heat transfer with steady and unsteady boundary conditions.
621. **Heat Transmission—Convection (3).** Pr., ME 421.  
General problems of convection, forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
622. **Heat Transmission—Radiation (3).** Pr., ME 421.  
Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar terrestrial and celestial radiation, and thermometry and temperature control.
630. **Advanced Strength of Materials (3).** Pr., ME 316, MH 361, or departmental approval.  
Selected topics in strength of materials. Beam on elastic foundation, graphical representations of three dimensional stress state, bending of curved bars, theories of failure.
631. **Theory of Elasticity I (3).** Pr., departmental approval.  
Three dimensional theory of stress and strain for small deformations. Applications to problems of plane stress and plane strain. Solutions by Airy Stress function and Kolosov-Muskhelishvili methods.
632. **Theory of Elasticity II (3).** Pr., ME 631.  
Selected topics in three dimensional problems. Torsion of bars, bending of prismatic bars, thermal stresses, introduction to the general (non-linear) theory of elasticity.
633. **Experimental Stress Analysis (3).** Pr., ME 316 or departmental approval.  
Relationship between strains and stresses. Use is made of modern experimental stress analysis techniques such as electric resistance strain gages, photoelasticity, brittle coatings, and photostress.
634. **Elastic Stability (3).** Pr., ME 631, CE 633 or departmental approval.  
Buckling failure of columns by bending, twisting or shear; lateral buckling of beams; shear buckling; buckling of thin plates and shells. Applications to problems.
635. **Intermediate Dynamics (3).** Pr., ME 325, MH 361.  
Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
636. **Non-Linear Oscillations (3).** Pr., ME 325, ME 427, or departmental approval.  
Free, forced, and self-excited oscillations in mechanical systems. Relaxation oscillations, response curves and stability considerations.
637. **Theory of Plates (3).** Pr., departmental approval.  
Analysis of stress, strain, and deformation of plates under applied transverse loads. Applications to plates of different geometries with various boundary conditions.
638. **Theory of Shells (3).** Pr., departmental approval.  
Analysis of stress, strain and deformation of shells under applied loads.
639. **Variational Mechanics (3).** Pr., consent of instructor.  
The problem of Belza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
660. **Metallurgy of the Solid State (3).** Pr., departmental approval.  
Basic principles relating to the behavior of materials. Ultimate structure of matter, crystalline structures, thermodynamic stability and reaction kinetics are discussed along with bonding, dislocations, polycrystalline structures, mechanical and thermal properties, electronic conduction, semi-conduction, and insulation. Considerable emphasis on application to real problems, predominantly of the engineering type.
661. **Metallurgy of Corrosion (3).** Pr., departmental approval.  
Nature and mechanism of corrosion. Effect of manufacturing methods including heat treatment. Effect of environment. Corrosion types and methods of corrosion prevention.
662. **Performance of Metals at Elevated Temperatures (3).** Pr., departmental approval.  
Fundamental behavior of metals at elevated temperatures. Commercial and experimental types of ferrous and non-ferrous alloys and their suitability for elevated temperature applications.

663. **X-ray Metallography (3).** Pr., ME 335 and MH 361.  
The principles of X-ray absorption and diffraction and application to the study of metals and other crystalline materials.
665. **Strengthening of Metals (3).** Pr., ME 335.  
A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.
666. **Plasticity of Metals (3).** Pr., ME 335.  
A quantitative treatment of: the minimization of plastic flow, by means of design considerations, where the phenomenon is associated with deleterious effects; the maximization of plastic flow, by means of material-condition and forming method considerations, where the objective is to form or shape.
667. **Dislocation Theory (3).** Pr., consent of instructor.  
Study of nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.
675. **Analysis of Mechanisms (3).** Pr., ME 323.  
The analysis of mechanisms by various techniques. Mechanisms of higher and lower complexity. Plane motion theory, space mechanisms, and introduction to synthesis.
676. **Synthesis of Mechanisms (3).** Pr., ME 675.  
Methods of synthesis using finite displacement techniques. Plane motion theory and its application to infinitesimal motion synthesis. Introduction to gross motion.
677. **Selected Topics in Mechanical Design (3).** Pr., ME 630 and ME 675.  
Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques involving computers.
690. **Seminar (credit to be arranged).** May be taken more than one quarter.
691. **Directed Reading in Mechanical Engineering (credit to be arranged).** May be taken more than one quarter.
699. **Research and Thesis (credit to be arranged).** May be taken more than one quarter.
799. **Research and Dissertation (credit to be arranged).** May be taken more than one quarter.

## Military Science (MS)

### BASIC COURSE

#### First Year (Freshman)

##### Military Science I

101. Orientation; History, Mission and Organization of the ROTC Program, Mechanical Training, M1 Rifle; Military/Civilian Obligations; US Army Reserves and National Guard; Definition and Causes of War; Evolution of Weapons and Warfare (1). Lec. 1, Drill 2.
102. Principles of War; Factors of National Power; National Objectives, Policies, Strategies and Instruments; Organization and Mission of the Armed Forces (1). Lec. 1, Drill 2.
103. Marksmanship; Range Firing; Organization, Mission and Capabilities of the Army (1). Lec. 1, Drill 2.

#### Second Year (Sophomore)

Military Science II (Pr., MS I or as determined by the Professor of Military Science).

201. American Military History (1). Lec. 2, Drill 2.  
The origins of the American Army to the present with emphasis on factors which led to the organizational, tactical, logistical, operational, strategic, social, and similar patterns found in the present day Army.
202. Introduction to Tactics and Operations (Map and Aerial Photograph Reading) (1). Lec. 2, Drill 2.  
Application of basic principles, emphasizing terrain appreciation and evaluation; marginal information; military and topographic map symbols; orientation; intersection; resection; military grid reference system; classes of aerial photography and elementary aerial photography reading.

**203. Introduction to Tactics and Operations (1). Lec. 2, Drill 2.**

Instruction in the basic military team; combat formations and patrolling; field fortification and camouflage, cover and concealment; technique of fire and principles of offensive and defensive combat.

**ADVANCED COURSE****Third Year (Junior)**

**Military Science III (Pr., all MS I and MS II or equivalent as determined by Professor of Military Science).**

**301. Leadership and Management I (1). Lec. 4, Drill 2.**

Educational psychology as pertains to the three stage instructional process; responsibilities and basic qualities of a leader; application of sound principles to the problems of platoon leaders.

**302. Fundamentals and Dynamics of the Military Team I (1). Lec. 4, Drill 2.**

Principles of Internal Defense/Development; familiarization with the roles of the various branches in the overall mission of the Army; principles and methods of communications.

**303. Fundamentals and Dynamics of the Military Team I (1). Lec. 4, Summer Camp Preparatory Training 2.**

Infantry organization; employment of the rifle platoon and company in offensive and defensive combat; familiarization with administrative procedures and general conduct of training at ROTC summer camp.

**Fourth Year (Senior)**

**Military Science IV (Pr., MS III or as determined by the Professor of Military Science).**

**401. Fundamentals and Dynamics of Military Team II (1). Lec. 4, Drill 2.**

Duties of the division staff, emphasizing staff estimates and reports, military intelligence, staff planning, operations, administration, logistics, and staff recommendations; principles of Internal Defense/Development and the Army Readiness Program.

**402. Fundamentals and Dynamics of Military Team II (1). Lec. 4, Drill 2.**

The fundamentals of the application of force using as a vehicle the combined arms team (Infantry, Armor, Artillery); duties and responsibilities of company and battalion officers in the combat arms.

**403. Leadership and Management II (1). Lec. 4, Drill 2.**

Functioning of military law system; relation of military law to civil law; types of conflict; inter-relationship of elements of national power; customs of the service; code of conduct; responsibilities and obligations of an officer.

**Music (MU)**

*Professors Glyde, Hinton, Tamblyn, Rosenbaum, and Tyre*

*Associate Professors Bentley, Moore, and Walls*

*Assistant Professors Rawlins, Calder, Lavore, Stephenson, and Mickelson*

*Instructors Colaanni, Hunter, and Kendrick*

**100. Music Convocation (0). All quarters. Required of all music students each quarter.**

Performance & lectures by faculty, guest artists, and students.

**131-32-33. Material and Organization of Music (5-5-5).**

A systematic study of harmony, counterpoint, form and style through the literature of music.

**211-12. Service Playing (1-1).**

Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.

**231-32-33. Material & Organization of Music (5-5-5). Pr., 133.**

Continuation of the study of Harmony, Counterpoint, Form and Style in music.

**251-52-53. Survey of Music Literature (1-1-1). Lec. and Lab. 3-3-3.**

Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.

**311. Liturgies (3).**

Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.

**312. Hymnology (3).**

The musical significance of hymns of the Christian church from earliest times to the present.

**331-32-33. Materials & Organization of Music (5-5-5). Pr., 233.**

Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.

**334-35-36. Counterpoint I-II-III (3-3-3). Pr., MU 233.**

I. Strict Counterpoint. Counterpoint in 5 species in 2 or 3 voices concluding with invertible counterpoint. II. Tonal counterpoint. Contrapuntal devices of the 18th Century including double counterpoint and imitation. III. Invention and Fugue. The study and writing of 2 part inventions, canonic treatment, and the 3 voice fugue.

**337-38-39. Modern Harmony I, II, III (3-3-3). Pr., 333.**

Twentieth century harmonic devices. An integrated approach to understanding contemporary writing, with emphasis on original work and analysis of the principal departments from "traditional" harmony.

**351-52-53. Music History I-II-III (3-3-3).**

Development of music from early times to the present day. Lectures, recorded examples, readings.

**361-62-63. Conducting I-II-III (3-1-1). Pr., MU 133, MU 153.**

I. Elementary basic baton techniques and introduction to score reading. II. Choral conducting. Elementary course in choral score reading and conducting choir and glee clubs. III. Instrumental conducting. Elementary course in instrumental score reading and conducting band, orchestra and instrumental ensembles.

**371. Introduction to Music (3). No credit allowed to Music Majors and Minors.**

The understanding of music including an explanation of basic terms, notations, rhythm, tonal system, vocal and piano score reading.

**409. Marching Band Techniques (3).**

Fundamental methods and procedures of the Marching Band.

**414. Care and Repair of Musical Instruments (1). Lec. 1, Lab. 3. Pr., senior standing.**

Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.

**415. Organ Literature and Design (3).**

Survey of organ literature correlating the forms of compositions and types of organ for which the music was written.

**416. Church Music Seminar (3). Pr., MU 311, 312, 361, 362, 415, or 442, or approval of instructor.**

The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.

**422-23-24. Theory Review (3-3-3). No credit for Applied Theory Composition or Pedagogy Majors.**

Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

**431-32-33. Music Analysis (3-3-3). Pr., MU 253 and MU 233.**

Harmonic and structural analysis of smaller instrumental forms; harmonic and structural analysis of the larger polyphonic and homophonic forms.

**434-35-36. Music Composition I-II-III (3-3-3). Pr., MU 233.**

Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.

**437-38-39. Orchestration I-II-III (3-3-3). Pr., MU 233.**

Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.

**441. Piano Pedagogy (3).**

For prospective piano teachers. Study of teaching methods for beginners and succeeding levels. Classification and analysis of teaching repertoire.

**442. Vocal Pedagogy (3).**

For prospective voice teachers. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.

**443. String Pedagogy (3).**

Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire.

**444. Instrumental Pedagogy (3).**

Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.

**445. Theory Pedagogy (3).**

Required of seniors majoring in theory and composition. Designed to present the problems of sight-singing, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.

**451. Keyboard Literature (3). Pr., junior standing.**

Masterworks of the clavichord, harpsichord, organ, and piano literature from the Baroque period to the present.

**452. Vocal Literature (3). Pr., junior standing.**

Vocal literature from Elizabethan time to the present, including representative European and American repertoire.

453. **Choral Literature (3). Pr., junior standing.**  
Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.
454. **Instrumental Literature (3).**  
Analysis and study of orchestral scores and parts from the classic, romantic and modern literature.
455. **Opera Literature (3).**  
Vocal music of the opera from the Baroque to the present time.

### General Elective Courses

201. **Fundamentals of Music (3).**  
Music designed primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.
372. **History of Jazz (3).**  
The growth of Jazz from its African and European roots to current experimentation.
373. **Appreciation of Music (3). May not be taken for credit by Music Majors or Minors.**  
Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.
374. **Masterpieces of Music (3). May not be taken for credit by Music Majors or Minors.**  
Representative musical works of each great period of musical history. No previous music training required.
- 477-78-79. **Music Arranging (3-3-3). By permission.**  
Project course in arranging various combinations from quartet to symphonic band, and arranging for solo and choral groups.

### Group Performance Courses

- 121-22-23. **Glee Club (1 hour credit per quarter).**  
MEN'S GLEE CLUB AND WOMEN'S GLEE CLUB are study and performing groups open to any Auburn student. (May be taken with or without credit.)
130. **Jazz Laboratory Band (1).**  
A musical ensemble for advanced musicians for the study and performance of music relating to the jazz idiom. By audition only.
- 221-22-23. **Choral Union (1 hour credit per quarter).**  
Open to any Auburn student. Required for all Music Majors and Minors. (May be taken with or without credit.)
- 321-22-23. **Concert Choir (1 hour credit per quarter).**  
CONCERT CHOIR is a small mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)
- 124-25-26. **Concert Band (1 hour credit per quarter).**  
Members of the Band are selected during the first week of each quarter. A minimum of 5 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. (May be taken with or without credit.)
- 127-28-29. **Orchestra (1 hour credit per quarter).**  
Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)
- 224-25-26. **Marching Band (1 hour credit per quarter).**  
Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 9 hours per week. Physical Education may be waived for members of the Marching Band.\* In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)
- 227-28-29. **Opera Workshop (1 hour credit per quarter).**  
Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)
- 324-25-26. **Music Ensemble (1 hour credit per quarter). (By permission.)**  
Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.)

\*In addition to the Physical Education stipulation, students will have the drill portion of Basic Military Training waived for the quarter they are enrolled in Marching Band.

**327-28-29. Piano Ensemble (1-1-1). Lab. 3-3-3.**

Study through performance of original compositions and transcriptions for piano-four-hands and two pianos using two to four players.

## Applied Music

Students desiring study in applied music must be approved by the Head Professor of Music before entrance into the course.

**080. Applied Music (0). May be repeated.**

Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.

**181-2-3. Applied Music (3-3-3).****281-2-3. Applied Music (3-3-3).****381-2-3. Applied Music (3-3-3).****481-2-3. Applied Music (3-3-3).**

Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.

**184-85-86. Applied Music (1-1-1).****284-85-86. Applied Music (1-1-1).****384-85-86. Applied Music (1-1-1).****484-85-86. Applied Music (1-1-1).**

Individual instruction in instrumental or vocal areas. Two ½ hour lessons per week.

**187-88-89. Applied Music (1-1-1).****287-88-89. Applied Music (1-1-1).****387-88-89. Applied Music (1-1-1).****487-88-89. Applied Music (1-1-1).**

Individual instruction in instrumental or vocal areas. One ½ hour lesson per week.

The amount of credit in Applied Music is based on the following practice schedule:

- 1 cr. hr.—5 hours weekly practice
- 2 cr. hrs.—8 hours weekly practice
- 3 cr. hrs.—12 hours weekly practice

## Applied Music Fees (Per Quarter)

One half-hour lesson per week	\$20.00
Two half-hour lessons per week	30.00
Class instruction in piano, etc.	5.00
Use of practice room, one hour per day	3.00
Use of practice room, two hours per day	5.00
Instrument rental	3.00

## Class Instruction in Applied Music

The Music Department offers a number of classes in Applied Music open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit. Tuition fee \$5.00.

**104-5-6. Piano Class (1-1-1). (2-2-2 lec. and lab.)**

Class instruction and practice in the rudiments of music as applied to piano playing. (See above for fee.)

**107-8-9. Voice Class (1-1-1). (2-2-2 lec. and lab.)**

Class instruction and practice in the rudiments of music as applied to voice. (See above for fee.)

**110-11-12. String Instruments Class (1-1-1). (2-2-2 lec. and lab.)**

Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing. (See above for fee.)

**113-14-15. Brass Instruments Class (1-1-1). (2-2-2 lec. and lab.)**

Class instruction and practice in the rudiments of music as applied to playing on trumpet, trombone and other brass instruments. (See above for fee.)

**116-17-18. Woodwind Instruments Class (1-1-1). (2-2-2 lec. and lab.)**

Class instruction and practice in the rudiments of music as applied to playing on clarinet, oboe, bassoon, flute and other woodwind instruments. (See above for fee.)



**119. Percussion Instruments Class (1). (2 labs.)**

Class instruction and practice in the rudiments of music as applied to playing percussion instruments: drums, bells, cymbals, triangle, tympani, etc. (See above for fee.)

**GRADUATE COURSES****422-23-24. Theory Review (3-3-3). Pr., senior standing and departmental approval.**

No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

**600-1-2. Advanced Instrumental and Choral Conducting (2-2-2).**

Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis.

**603. Brass Instruments Techniques (1). Lec. 1, Lab. 3.**

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments.

**604. Woodwind Instruments Techniques (1). Lec. 1, Lab. 3.**

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments.

**605. Percussion Instruments Techniques (1). Lec. 1, Lab. 3.**

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments.

**606. Music in the Arts (4).**

Music in relation to architecture, the plastic arts, and poetry.

**607. Choral Literature of the Classic, Romantic and Modern Periods (4).**

The styles, forms, and performance practices of the choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.

**608. Choral Arranging (4). Pr., departmental approval.**

Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.

**609. Seminar in 20th Century Music (3-3-3). Pr., departmental approval.**

Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)

**610. Band Arranging (4). Pr., departmental approval.**

Advanced arranging for various band organizations. Participation in band is required.

**611. Orchestral Arranging (4). Pr., departmental approval.**

Advanced arranging for various orchestral organizations. Participation in orchestra is required.

**612. Acoustics in Music (3). Pr., departmental approval.**

The physics of sound as related to music.

**634. Music History Seminar (2). Pr., departmental approval.**

Different aspects of the history of music. Specific research areas chosen each quarter. (May be repeated for a maximum of 6 hrs. credit.)

**644. Repertoire Seminar (2-2-2). Pr., departmental approval.**

The literature of wind instruments through analysis and performance. (May be repeated for a maximum of 6 hrs. credit.)

**650-1-2. Techniques of Private Instrumental Instruction (3-3-3). Pr., departmental approval.**

Analysis of teaching and supervised teaching.

**660-1-2. Independent Study in Applied Music (3-3-3). Pr., departmental approval.**

Advanced private study and recital.

**681-2-3. Independent Study in (A) Composition, (B) Analysis (2-3, 2-3, 2-3). Pr., departmental approval.****Naval Science (NS)**

(List of courses will be found on pages 180-181)

**Nutrition and Foods (NF)**

*Professors Davis and Van de Mark  
Associate Professors Chastain and White  
Assistant Professors Cannon, Hamid, and Rush  
Instructor Shen*

**102. Food and Nutrition (5). Lec. 3, Lab. 4. Each quarter.**

Elements of nutrition and principles underlying the fundamental processes and standards of food preparation.

119. **Nutrition and Man (3).**  
The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.
202. **Meal Management (5). Lec. 4, Lab. 3. Each quarter. Pr., HE 102.**  
Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.
302. **Cultural Aspects of Food Service (3). Each quarter.**  
Historical and artistic influences on the selection of modern table accessories used in home and institutional food services.
312. **Nutritional Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 203.**  
Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.
322. **Food Preservation (3). Lec. 2, Lab. 3. Fall, Summer. Pr., VM 311 (Bact.).**  
Preservation of foods by fermentation, crystallization, canning and freezing with special emphasis placed in better quality of foods preserved at home.
342. **Nutrition and Dietetics (5). Lec. 3, Lab. 4. Winter. Pr., HE 312, HE 372.**  
Identification, function, metabolism and sources of specific nutrients required by man for normal growth, development, and maintenance. For nutrition majors.
352. **Institution Organization and Personnel Management (5). Winter.**  
Quality food service operation as related to management principles, methods of control, and personnel management.
353. **Community and Family Health (3). Lec. 2, Lab. 2. General elective.**  
Health problems related to the community and family including a survey of available health facilities with field trips.
362. **Problems in Community Nutrition (3). Pr., HE 372, or equivalent.**  
Methods of presenting nutrition information to organizations engaged in community work. Field experience.
372. **Fundamentals of Nutrition (3). Lec. 3. Each Quarter.**  
Principles of human nutrition and factors influencing food requirements.
392. **Family Nutrition (3). Lec. 3. Pr., HE 372.**  
Application of the principles of nutrition to family members of all ages.
402. **Diet Therapy (5). Lec. 4, Lab. 2. Spring. Pr., junior standing, HE 332, and HE 342.**  
Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.
412. **Quantity Food Production (5). Lec. 3, Lab. 4. Fall. Pr., junior standing and HE 202.**  
Institutional menu planning, preparation and serving of foods. Use, operation and maintenance of equipment. University kitchens are used for laboratory experience.
422. **Institution Food Purchasing (5). Lec. 4, Lab. 2. Junior standing.**  
Wholesale food marketing and the purchase of food for institutions with emphasis on factors determining quality and cost.
432. **Food Service Planning, Layout and Equipment (5). Lec. 4, Lab. 2. Spring. Pr., junior standing and HE 352.**  
Floor plans and layouts with emphasis on materials, specifications, and maintenance of equipment and furnishings for institutional food units.
442. **Catering (3). Lec. 2, Lab. 3. Winter. Pr., HE 202.**  
Types of catered food-service functions: planning, pricing, organization, management, equipment and service.
462. **Experimental Foods (5). Lec. 3, Lab. 4. Pr., junior standing, HE 202, and CH 203.**  
Causes and effects of various methods of food preparation. It includes basic chemical reactions involved in food combinations. The course gives a foundation for work in food research.
472. **Advanced Community Nutrition (3). Pr., junior standing and satisfactory course in nutrition.**  
Nutrition problems and practices that exist in a modern society.
479. **Modern Views of Nutrition (3). Pr., junior standing and satisfactory course in nutrition.**  
Current concepts in nutrition and related fields.
482. **Institution Food Service Cost Control (5). Lec. 4, Lab. 2. Pr., junior standing.**  
Food control and storeroom management in hospitals, commercial units, and school food services.
489. **International Nutrition (3). Pr., junior standing and satisfactory course in nutrition.**  
Nutritional status of world population and local, national, and international programs for improvement.

492. **Infant and Child Nutrition (5).** Pr., junior standing and HE 372 or HE 332 and HE 342.

Nutrition requirements for growth from pre-natal life through adolescence.

#### GRADUATE COURSES

601. **Special Seminars in Home Economics (5).**  
A. Child Development and/or Family Life; B. Clothing and/or Textiles; C. Family Economics, Home Management, Equipment and/or Housing; D. Foods and/or Nutrition.
602. **Seminar (1). Winter and Summer.**  
One quarter required for all graduate students in all departments of Home Economics. May be repeated for a maximum of 3 hours credit.
603. **Home Economics in Higher Education (5).**  
The effects of scientific, technological and social developments on the family and the Home Economics profession as they have implications for higher education in this discipline. Emphasis: current trends in subject matter areas, scope and program development, administration, and instructional resources.
605. **Methods of Research in Home Economics (3).**  
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **Research Studies in Home Economics. Credit to be arranged (2-5).** Pr., consent of instructor. May be taken more than one quarter. Not to exceed 5 hours credit toward minimum of 45 for M.S. or 48 for M.H.E. degree.
620. **Experimental Foods (5).** Pr., or coreq., CH 304.  
Food preparation from the experimental standpoint, giving instruction in techniques for subjective and objective measurement of food quality.
621. **Chemical and Physical Properties of Foods (5).** Lec. 4, Lab. 3. Pr., HE 202 and HE 462.  
Chemical and physical changes of importance in food preparation and processing.
622. **Problems in Food Preservation (5).** Pr., VM 311 and HE 332.  
Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
623. **Readings in Food or Nutrition (5)** Pr., HE 372 or HE 332, CH 203.  
A critical survey of current literature in nutrition and food consumption.
624. **Advanced Nutrition I (5).** Pr., HE 332, HE 342, CH 203, HE 312, or equivalents.  
Carbohydrates, fats and proteins.
625. **Advanced Nutrition II (5).** Pr., HE 332, HE 342, CH 203, HE 312 or equivalents.  
Vitamins, minerals and nutritional relationships.
626. **Advanced Nutrition III (5).** Pr., HE 624 and 625, or equivalent.  
Assessment and application of nutritional status. Methods of appraisal of nutritional status, dietary, biochemical and clinical.
628. **Research Methods in Nutrition (5).**  
Special problems in human nutrition.
699. **Research and Thesis. Credit to be arranged.**  
Required of all students under the Thesis Option in any field.

#### Pharmacy (PY)

*Dean Coker*

*Professors Coker, Hargreaves, Hocking, and Williams*

*Associate Professors Kochhar, Rash, Thomasson, and Wilken*

*Assistant Professors Hamrick and Shrader*

*Instructor Crevar*

*Research Lecturers in Toxicology Carl J. Rehling and Paul E. Shoffeitt*

#### Pharmacy

100. **Pharmacy Convocation (0).** All quarters.  
Required of all pharmacy students each quarter. Professional topics discussed by visiting lecturers, faculty and students.
101. **Introduction to Pharmacy (3).**  
Orientation and general survey of the scope of pharmacy, its organizations and literature with a brief introduction into principles of pharmacy.
102. **Pharmaceutical Mathematics (3).** Pr., MH 161.  
Mathematical calculations and concepts fundamental to the pharmaceutical sciences.

202. **Pharmaceutical Terminology (2).** Pr., first professional year standing.  
Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
205. **History of Pharmacy (3).** Pr., first professional year standing.  
A general survey of the history of pharmacy designed to provide a knowledge of the heritage of the profession.
300. **Professional Accessories (3).** Pr., second professional year standing.  
The use and capabilities of non-medical professional items such as clinical thermometers, rubber goods, and accessories, atomizers, surgical dressings, surgical supports, trusses.
301. **Pharmaceutical Technology I (5).** Lec. 3, Lab. 6. Pr., CH 208, PY 102, second professional year standing.  
Physical-chemical principles applied to develop thorough understanding of solid pharmaceutical dosage forms from bulk powders to more sophisticated sustained-release medications.
303. **Pharmaceutical Technology II (5).** Lec. 3, Lab. 6. Pr., PY 301, CH 204, CH 302.  
Continuation of PY 301 in which physical and chemical principles concerning homogeneous liquid dosage forms are studied. Selected official solutions, syrups, elixirs, spirits, etc., are considered from this viewpoint.
304. **Pharmaceutical Technology III (5).** Lec. 3, Lab. 6. Pr., PY 303.  
Continuation of PY 303 dealing with heterogeneous and plastic systems. Physical and chemical principles utilized in the study of the plastic and polyphasic dosage forms including ointments, creams, suspensions, colloids, mixtures, magmas, etc.
308. **Hospital Pharmacy Administration (3).** Pr., second professional year standing.  
The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships. Field trips to representative hospital pharmacies.
400. **Dispensing Pharmacy I (5).** Lec. 3, Lab. 6. Pr., PY 304.  
Compounding of prescriptions of an elementary nature, illustrating virtually all types of prescriptions.
401. **Dispensing Pharmacy II (5).** Lec. 3, Lab. 6. Pr., PY 400.  
Advanced dispensing pharmacy and prescription laboratory. Prescriptions of an advanced nature are compounded. Special attention is given to the subject of incompatibilities.
402. **Dispensing Pharmacy III (5).** Lec. 3, Lab. 6. Corequisite, PY 401.  
Practical pharmaceutical compounding and dispensing, related to modern drug outlets. Certain aspects of drug detailing will be discussed.
410. **Advanced Pharmacy (5).** Lec. 3, Lab. 6. Pr., PY 400 and second professional year standing.  
The applications of modern pharmaceutical aids, such as surface active agents, the solubilizing agents and the complexing agents in compounding.
411. **Elements of Pharmaceutical Manufacturing (5).** Lec. 2, Lab. 9. Pr., PY 304, consent of instructor, and third professional year standing.  
Manufacturing procedures, operation, and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
412. **Public and Professional Relations (3).** Pr., second professional year standing.
413. **Special Problems (1-8).** Pr., second professional year standing.
414. **Pharmaceutical Specialties (3).** Pr., third professional year standing.  
More important non-official specialties available to modern prescription practice and over-the-counter sales are studied.

#### COURSES FOR GRADUATE STUDENTS

601. **Parenteral Preparations (5).** Lec. 3, Lab. 6. Pr., PY 304 and consent of instructor.  
Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
602. **Tablet Manufacture (5).** Lec. 2, Lab. 9. Pr., PY 304.  
Essentials in the manufacture, coating and evaluation of compressed tablets.
603. **Product Development (5).** Lec. 3, Lab. 6. Pr., PY 304.  
Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
608. **Biopharmaceutics (3).** Lec. 2, Lab. 3. Pr., consent of instructor.  
The relationship between some physical and chemical properties of drugs, their various dosage forms and subsequent biological effects.
609. **Institutional Pharmacy (5).** Lec. 4, Lab. 3. Pr., PY 401 and consent of instructor.  
Comprehensive presentation of pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. The responsibilities of the director of pharmacy service in a hospital. Field trips taken and a term project on a current aspect of Institutional Pharmacy is required.

680. Graduate Seminar (1). Pr., admission to Graduate School.  
Required of all pharmacy graduate students each quarter.
695. Special Problems (2-5 hours). Pr., consent of instructor.  
May repeat for a maximum of 8 hours.

### Pharmaceutical Chemistry

201. Inorganic Pharmaceutical Chemistry (5). Pr., CH 105, CH 204.  
Inorganic chemicals; their manufacture, chemical properties, pharmaceutical and therapeutic uses, doses and preparations. Tests for identity and purity, together with assay methods are considered.
203. Organic Pharmaceutical Chemistry (5). Pr., PY 201, CH 208.  
Organic chemicals; their manufacture, chemical properties, trade names, pharmaceutical and therapeutic uses, doses and preparations.
302. Organic Pharmaceutical Chemistry (5). Pr., PY 203.  
Continuation of PY 203.
305. Pharmaceutical Assay (3). Lec. 1, Lab. 6. Pr., CH 204, CH 208.  
Pharmaceutical Assay procedures not covered in general quantitative analysis, physical and chemical constants of fatty oils, proximate assay of vegetable drugs, official arsenic test, alcohol determination and the assay of alkaloidal drugs.
404. Chemistry of Natural Products (5). Pr., CH 302 and second professional year standing.  
Chemistry and nomenclature of fatty oils, volatile oils, steroids, glycosides, alkaloids, antibiotics, vitamins, and other natural products.
421. Advanced Inorganic Pharmaceutical Chemistry (5). Pr., PY 201 and second professional year standing.  
Modern structural concepts of atomic and molecular theory, and reaction mechanisms of inorganic chemicals of medicinal importance.

### COURSES FOR GRADUATE STUDENTS

- 620-21-22. Chemistry of Synthetic Drugs (5-5-5). Pr., PY 302 or consent of instructor.  
Historical background, pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosterism, metabolite antagonism, enzyme inhibition, an exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-24-25. Synthesis of Drugs (5-5-5). Lec. 2, Lab. 9. Coreq., PY 620-21-22 or consent of instructor.  
The principles and techniques of analysis as applied to the various therapeutic classes.
- 626-27. Analytical and Control Methods (5-5). Lec. 3, Lab. 6. Pr., PY 305 or consent of instructor.  
The principles and techniques of analysis as applied to the various therapeutic classes.
628. Steroid Chemistry (5). Pr., PY 620 or consent of instructor.  
Structure determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
629. Alkaloid Chemistry (5). Pr., PY 620 or consent of instructor.  
Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmacological and pharmaceutical importance.
660. Heterocyclic Medicinal Chemistry (5). Pr., consent of instructor.  
The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.

### Pharmacology-Toxicology

403. Toxicology (5). Pr., ZY 424, CH 208 and second professional year standing.  
Fundamentals of the isolation, identification, symptoms and treatment of the more common poisons.
405. Pharmacology I (5). Lec. 4, Lab. 3. Pr., ZY 424, CH 302 and second professional year standing.  
Absorption and fate, mechanism of action, pharmaco-chemical relationships and toxicology of the official and more important non-official drugs, with a brief coverage of pathological conditions which indicate specific uses in therapy.
406. Pharmacology II (5). Lec. 4, Lab. 3. Pr., ZY 424, CH 302 and second professional year standing.  
Continuation of PY 405. Pharmacology of vitamins, hormones, biologicals and antibiotics with major emphasis on endocrine products and deficiency states as related to specific therapy.

407. **Chemotherapeutic Drugs (5).** Pr., CH 302, VM 204 and second professional year standing.  
Structure-action relationship of drugs and their use in inhibiting or destroying micro-organisms.
428. **Public Health (5).** Pr., VM 200, VM 204 or VM 311 and second professional year standing.  
Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.
429. **Biochemical Pharmacology (3).** Lec. 1, Lab. 6. Pr., CH 302 and second professional year standing.  
Application of biochemical principles and techniques in the study of mechanisms of drug action.
430. **Pharmacological Techniques (5).** Lec. 4, Lab. 3. Pr., ZY 424 and second professional year standing.  
Principles and techniques of procedures used in drug evaluation in animal subjects.
431. **Cellular Pharmacology (5).** Lec. 4, Lab. 3. Pr., PY 405-6, second professional year standing.  
Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.
432. **Fundamentals of Bionucleonics (3).** Lec. 2, Lab. 3. Pr., PS 206 or consent of instructor and second professional year standing.  
Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.

#### COURSES FOR GRADUATE STUDENTS

630. **Toxicological Methods (3).** Lec. 1, Lab. 6. Pr., PY 403 or equivalent.  
Techniques applied to the separation and chemical identification of the more common volatile, non-volatile organic and metallic poisons.
- 631-32. **Psychopharmacology (5-5).** Lec. 4, Lab. 3. - Lec. 3, Lab. 6. Pr., PY 431 for PY 631 and PG 320 or PG 445 for PY 632.  
Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines and metabolic energy systems; measures of rate of behavioral change; critique of behavioral screening techniques.
633. **Bioassay (5).** Lec. 4, Lab. 3. Pr., PY 430, MH 127 or an equivalent course in statistics.  
Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
637. **Pharmacology Seminar (3).** Pr., PY 430.
638. **Toxicology Seminar (1-3).** Pr., graduate standing.  
Students are expected to present reviews of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-51. **Advanced Toxicology (5-5).** Lec. 3, Lab. 6. Pr., PY 630 or equivalent.  
The mechanism of action of poisons and antidotes, lethal doses and methods of detection and quantitation of poisons in tissues and body fluids. Practical application of analytic procedures and estimation of poisons in post-mortem and clinical specimens. The student will participate in a minimum of four post-mortem examinations with instructions in proper technique to obtaining specimens for toxicological analyses.
652. **Forensic Toxicology (3).** Pr., consent of instructor.  
This course embraces a summary of medical jurisprudence including the laws governing the practice of forensic toxicology in criminal and civil prosecution. Collection, preservation and chain of evidence, and testimony in courts are stressed.

#### Pharmacognosy

306. **Pharmacognosy I (5).** Lec. 4, Lab. 3. Pr., BI 102, BI 103 and CH 207.  
Plant and animal drugs studied from a basic biological standpoint, including classification (taxonomy), morphology, histology, microscopy, biogeography and related features.
307. **Pharmacognosy II (5).** Lec. 4, Lab. 3. Pr., CH 302, PY 306.  
Biochemical presentation of drugs of natural origin including morphology, histology, mode of production, medicinally active constituents, assays and applications.
440. **Histology of Natural Products (3).** Lec. 2, Lab. 4. Pr., consent of instructor and second professional year standing.  
Micro-chemical, micro-analytical, and micro-sectioning techniques, including methods of fixation, dehydration, embedding and staining tissues in the preparation of permanent mounts of microslides, with use of microtome and micro-dissection techniques.
441. **Commercial Pharmacognosy (3).** Pr., consent of instructor.  
Commercial aspects of crude drugs, both wild and cultivated, foreign and domestic; composition and application of pesticides.



## COURSES PRIMARILY FOR GRADUATE STUDENTS

640. **Advanced Pharmacognosy (5).** Lec. 3, Lab. 6. Pr., PY 307 or equivalent.  
Comprehensive study of both official and unofficial crude drugs conducted macroscopically and microscopically; techniques of use of camera lucida, microtome and microphotographic equipment; pharmacognosy of previously undescribed drugs.
641. **Advanced Microanalysis (5).** Lec. 3, Lab. 6. Pr., consent of instructor.  
Methods of microscopy and microchemistry of natural materials and compounds.
642. **Histology of Medicinal Plants (5).** Lec. 3, Lab. 6. Pr., PY 440.  
Microscopic structure of medicinal plants in fresh or preserved state as related to the origin and fate of plant compounds.
699. **Research and Thesis (5).**

## Pharmacy Administration

408. **Pharmacy Management I (3).** Pr., EC 200, ACF 211, PY 416.  
Elements of community pharmacy management, including location, layout organization, buying and stock control, advertisement, selling, merchandising, financial analysis, competitive practice, and socio-economic factors of modern Pharmacy.
409. **Pharmaceutical Management II (3).** Pr., PY 408.  
A continuation of PY 408.
415. **Pharmaceutical Jurisprudence (3).** Pr., third professional year standing.  
Legal aspects of pharmaceutical practice, giving primary consideration to State and Federal regulations bearing thereon.
416. **Drug Marketing (3).** Pr., EC 200, PY 101.  
Basic principles of marketing drug products from the manufacturer to the consumer.

## Philosophy (PA)

Head Professor Pauson

Assistant Professors Andelson, Brown, Davis, McKown, and Walters

Instructors Digby, Kneupper

202. **Ethics and Society (5).**  
Human values as expressed in customs, institutions, politics, and philosophies of principal world civilizations. Ethics in this sense shown as grounded in and influencing the total culture of a people.
210. **Introduction to Philosophy (3).** General elective.  
The basic philosophical problems underlying western civilization.
211. **Introduction to Deductive Logic (3).** General elective.  
The analysis and criticism of arguments, the formation of principles of deduction and selected philosophical problems of logic.
212. **Introduction to Inductive Logic (3).** General elective.  
Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation and confirmation.
302. **Introduction to Ethics (3).** General elective.  
The general principles of morality and human conduct.
310. **Eastern Religious Thought (3).** General elective.  
Readings from primary and secondary sources related to Hinduism, Jainism, Buddhism, Taoism, Confucianism, Shintoism, and Sikhism.
315. **Western Religious Thought (3).** General elective.  
Readings from primary and secondary sources related to Ancient Egyptian, Mesopotamian, and Greek religions, Judaism, Zoroastrianism, Christianity, and Islam.
325. **Aesthetics (5).**  
The history of the aesthetic theory for determining foundations of critical reflection on the arts of literature, drama, painting, sculpture, architecture, and music.
330. **Philosophy of Religion (5).**  
Religious ideas including the origin of religion; the nature of religion; the various concepts of God, the soul, immortality; and internal and external criticisms of religion.
400. **Philosophy of Science (5).** Pr., junior standing.  
Implications for human values of some important concepts and methods in the social and natural sciences.
401. **The Philosophy of Communism (5).** Pr., junior standing.  
The theory, practice, and social motivation of Marxism, but with some additional studies in peripheral areas.

402. **Existentialism (5). Pr., junior standing.**  
Examines a type of philosophy which approaches the problem of being through a careful analysis of the basic structures of human existence.
403. **Symbolic Logic (5). Pr., junior standing.**  
Extended treatment of symbolic logic. (PA 308 is desirable but not necessary for this course.)
404. **Modern Ethical Theories (5). Pr., junior standing.**  
Problems and methods in contemporary moral philosophy.
410. **Ancient and Medieval Philosophy (5). Pr., junior standing.**  
Philosophical thought of ancient Greece and Rome, and of medieval Christendom.
420. **Modern Philosophy (5). Pr., junior standing.**  
Philosophical thought from Descartes through Kant.
425. **Nineteenth Century Philosophy (5). Pr., junior standing.**  
Philosophical thought in Germany, England, and France from 1800-1900.
430. **Contemporary Philosophy (5). Pr., junior standing.**  
Philosophical thought from James through the present time.
440. **American Philosophy (5). Pr., junior standing.**  
American philosophical thought from colonial times to William James.
455. **Metaphysics (5). Pr., two courses in Philosophy and junior standing.**  
The major theories of the ultimate nature of reality.
460. **Epistemology (5). Pr., two courses in Philosophy and junior standing.**  
The origin, nature, kinds, and validity of knowledge, with a consideration of faith, intuition, belief, opinion, certainty, and probability.
470. **Plato (5). Pr., junior standing.**  
Plato's major works together with a survey of his other productions.
475. **Aristotle (5). Pr., junior standing.**  
Aristotle's philosophy with special emphasis on epistemology, metaphysics, ethics, and psychology. His relation to his predecessors and his central role in western thought are also examined.
- 498-99. **Readings for Honors (5-5). Pr., junior standing, a 2.5 average in relevant prior work either in philosophy or in related areas and permission of Department Head and Instructor.**  
Specific reading programs may be developed which pertain to a particular philosopher, period or problem. An honors paper and an examination will be expected.
650. **Seminar (5). Pr., graduate standing and permission of instructor.**  
Content will change each quarter in a calendar year, varying from movements of thought to intensive study of one of the great thinkers such as Plato or Whitehead.

## Physics (PS)

*Head Professor Carr*

*Professors Alford and Hughes*

*Alumni Associate Research Professor Fromhold*

*Associate Research Professor Budenstein*

*Associate Professors Andrews, Askeu, French, Kinzer, Latimer, Mowat, and Sparks*

*Assistant Professors Harlan, Thaxton, Ward, and Wise*

*Instructors Horton and Forsythe*

201. **General Physics I (5). Lec. 4, Lab. 3. Pr., MH 163 (or concurrently).**  
The first three quarters in a basic physics course comprising PS 201-202-203. Mechanics, sound, heat, electricity, magnetism, and light are emphasized. For students in chemistry, engineering, physics and applied physics.
202. **General Physics II (5). Lec. 4, Lab. 3. Pr., PS 201; MH 264 (or concurrently).**
203. **General Physics III (5). Lec. 4, Lab. 3. Pr., PS 202; MH 264.**
204. **Foundations of Physics (5). Credit in PS 220 and 205 excludes credit for this course.**  
The basic principles of mechanics, heat, light, sound, electricity and magnetism and selected topics. For students in aeronautical administration, agricultural and industrial arts education, industrial design, and home economics.
205. **Introductory Physics—Mechanics, Heat and Sound (5). Lec. 4, Lab. 3. Pr., MH 122 or 160.**  
The first half of a two-quarter course in the fundamentals of physics. The quantitative as well as the qualitative aspects of the subject are stressed. For students in architecture, forestry, laboratory technology, pharmacy, pre-dentistry, pre-medicine, pre-veterinary medicine, industrial management, and science and literature. The weekly three-hour laboratory periods are devoted to the performance of appropriate experiments.

206. **Introductory Physics—Electricity and Light (5).** Lec. 4, Lab. 3. Pr., PS 205.  
Continuation of PS 205.
210. **Principles of Modern Physics (5).** Lec. 4, Lab. 3. Pr., PS 206.  
The fundamental principles of physics to current topics. Lecture discussions are extended and supplemented by laboratory experience. Subjects include relativity, atomic and nuclear phenomena, and radiation.
217. **Astronomy (3). General elective.**  
Descriptive astronomy, accompanied by occasional observations of the heavenly bodies with a three-inch refracting telescope.
220. **General Physics I (4).** Lec. 3, Lab. 3. Pr., MH 163 (or concurrently).  
Mechanics and heat. PS 220-221-222 comprise a three-quarter sequence using calculus wherein a number of topics are discussed in depth. The sequence is intended to serve as a foundation for students in the science and engineering curricula.
221. **General Physics II (4).** Lec. 3, Lab. 3. Pr., PS 220; MH 264 (or concurrently).  
Wave motion, sound, and optics.
222. **General Physics III (4).** Lec. 3, Lab. 3. Pr., PS 221.  
Electricity and magnetism.
- 300-1. **Intermediate Electricity and Magnetism I and II (4-4).** Lec. 3, Lab. 3. Pr., PS 203, PS 210, or PS 320; MH 401.  
Development and application of Maxwell's equations. Topics include: a.c. circuits; electromagnetic measurements; laws of Gauss, Ampere, and Faraday; electric and magnetic properties of matter; and electromagnetic wave propagation.
302. **Electronics (5).** Lec. 4, Lab. 3. Pr., PS 203, MH 264.  
Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators; tube and transistor voltage and power amplifiers; feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.
303. **Optics (5).** Lec. 4, Lab. 3. Pr., PS 202, MH 264.  
Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.
304. **Applied Spectroscopy (5).** Lec. 4, Lab. 3. Pr., PS 203, MH 163.  
The more important concepts of the origin of spectra; a study of instruments and techniques of practical spectroscopy. Laboratory experiments designed to give students in both Chemistry and Physics a working knowledge of spectroscopy as a tool.
305. **Introduction to Modern Physics (5).** Lec. 4, Lab. 3. Pr., PS 203, MH 264.  
Selected topics of modern physics, including atomic structure, nuclear structure, wave-particle dualism, and special relativity.
320. **Modern Physics for Engineers (3).** Lec. 3. Pr., 221, MH 264.  
Introduction to modern physics, including special relativity, Schrodinger wave mechanics, atomic and nuclear systems, elementary particles.
330. **Fundamentals of Physics (10).** Demonstration lecture 3, lecture-recitation 7, laboratory 4, seminar 1. Pr., MH 160 (or concurrently). Offered Summer only by special arrangement.  
Use of PSSC materials in which the fundamental principals of optics, mechanics, electricity and magnetism are stressed. For secondary school physics teachers with a limited background in physics who are enrolled in the Physics Summer Institute.
340. **Intermediate Mechanics (3).** Pr., PS 221, MH 265.  
Selected topics in mechanics including vector and coordinate kinematics and dynamics; free and driven damped harmonic oscillator; generalized coordinates and an introduction to LaGrange's equations.
401. **Theoretical Physics I—Mechanics (5).** Lec. 4, Prob. 2. Pr., junior standing, PS 203, MH 361.  
Newton's laws; systems of particles; conservation laws; free, damped, and forced oscillations; introduction to calculus of variations.
402. **Theoretical Physics II—Mechanics Continued (5).** Lec. 4, Prob. 2. Pr., junior standing, PS 401.  
Calculus of variations; Hamilton's Principle and LaGrange's equations; vibrating systems; vector analysis; dynamics of rigid bodies.
403. **Theoretical Physics III (5).** Lec. 4, Prob. 2. Pr., 301, PS 402, junior standing.  
Introduction to electromagnetic theory using the mathematics of vector fields. The physical interpretation of the different fields is stressed.
404. **Thermodynamics (5).** Pr., junior standing, PS 305, MH 362.  
Equations of state. First and second laws of thermodynamics. The absolute temperature scale; the entropy, free energy, and Gibbs potential; general conditions of equilibrium. Application to reactions in gases and dilute solutions. Nernst's postulate.

405. **Nuclear Physics (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305, MH 264.  
Nuclear radiations; transmutations; natural and artificial radioactivity; binding energy; nuclear forces; structure of the nucleus; nuclear fission and its applications. Appropriate laboratory experiments form a part of the course.
406. **Advanced Laboratory I (2).** Lab. 6. Pr., PS 301 or 302, 305, junior standing.  
Research oriented experiments will be selected in the areas of biophysics, plasmas, low temperature, high vacuum, wave propagation, nuclear and atomic spectroscopy, Mossbauer effect, nuclear magnetic resonance, transport in solids, Hall effect, mass spectrometry, advanced electronics, and other areas of current interest in research.
407. **Advanced Laboratory II (2).** Lab. 6. Pr., PS 406.  
A continuation of PS 406.
408. **Advanced Laboratory III (2).** Lab. 6. Pr., PS 407.  
A continuation of PS 407.
409. **Introduction to Reactor Physics I (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305, PS 405, MH 362, or permission of instructor.  
Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.
410. **Introduction to Reactor Physics II (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 409.  
Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
412. **Seminar in Modern Physics (1).** Pr., senior standing.  
Library search, written reports, and oral presentation of a pertinent topic in modern physics.
413. **Introduction to X-ray Crystallography (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305, or permission of instructor.  
Principles of crystallography, properties of X-rays, Laue and powder techniques, applications to crystal structure and grain size.
414. **Electron Optics and Microscopy (5).** Lec. 3, Lab. 6. Pr., junior standing and PS 203 and MH 264.  
Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 415-16. **Intermediate Modern Physics I and II (5-5).** Pr., junior standing and MH 265.  
Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
417. **Introduction to Biophysics (5).** Pr., permission of the instructor, junior standing.  
The physics of biological systems, with emphasis on the cellular and subcellular levels; effects of light and high energy radiations, bio-electric phenomena, bio-energetics, etc.
419. **Scientific Instrumentation (3).** Lec. 2, Lab. 3. Pr., junior standing; PS 206; MH 162; and permission of instructor.  
For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.
421. **Modern Electronics (5).** Lec. 3, Lab. 6. Pr., PS 302 and junior standing.  
Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
430. **Physics for High School Teachers I (4).** Lec. 3, Lab. 3. Pr., PS 204 or equivalent, junior standing.  
Fundamental laws in mechanics, heat, and sound with particular emphasis upon such broad principles as Newton's laws of motion, the conservation of energy and momentum, and the transfer of energy.
431. **Physics for High School Teachers II (4).** Lec. 3, Lab. 3. Pr., PS 430, junior standing.  
Fundamental laws in light, electricity, magnetism, and an introduction to some basic phenomena in atomic, molecular, and nuclear physics.
435. **Introduction to Solid State Physics (5).** Pr., MH 361, junior standing.  
Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
470. **Health Physics (5).** Lec. 4, Lab. 3. Pr., permission of the instructor, junior standing.  
Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.

## GRADUATE COURSES

601. **Advanced Dynamics I (3).** Pr., PS 402.  
D'Alembert's principle; introduction to the calculus of variation; Hamilton's principle and Hamilton's equations; principle of least action.

602. **Advanced Dynamics II (3).** Pr., PS 601.  
Canonical variables and contact transformations; the Hamilton-Jacobi equation; action; angle variables; Poisson brackets; continuous systems.
603. **Mechanics of Continuous Media (3).** Pr., PS 602.  
Introduction to theories of elasticity and fluids.
- 604-5-6. **Theory of Electricity and Magnetism I-II-III (3-3-3).** Pr., PS 403, Coreq., MH 607-8-9.  
Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems, electric currents, Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems.
607. **Physical Optics (3).** Pr., PS 606.  
Application of Maxwell's equations to optical phenomena including Kirchhoff's formulation, propagation of electromagnetic waves in anisotropic media, double refraction, dispersion.
611. **Plasma Physics I (3).** Pr., PS 301, PS 402, or permission of instructor.  
Orbit theory, fluid model, Alfvén waves, plasma stability, and plasma radiations.
612. **Plasma Physics II (3).** Pr., PS 611 or permission of instructor.  
Theory of plasma waves, shocks, instabilities, and magneto-hydrodynamics.
628. **Statistical Mechanics I (3).** Pr., PS 404, 601.  
Statistical ensembles in classical mechanics, the Maxwell-Boltzmann distribution law. Boltzmann's H-theorem, and an introduction to quantum statistical mechanics.
629. **Statistical Mechanics II (3).** Pr., PS 628.  
Quantum mechanical H-theorem, applications, introduction to non-equilibrium statistical mechanics.
630. **Modern Physics for High School Teachers (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 431 or equivalent, MH 487 or equivalent.  
Physics since 1890 including: structure of matter; atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion; and cosmic rays.
632. **Special Theory of Relativity (3).** Pr., PS 602, PS 605.  
Relativistic mechanics, covariant formulation of Maxwell's field equations, Lagrangian and Hamiltonian formulation of fields.
635. **Solid State Physics I (3).** Pr., PS 435, PS 643.  
Electrons in a perfect crystal lattice, quantum mechanical formulations of the many body problem, molecular bonding, description of the symmetry properties of solids.
636. **Solid State Physics II (3).** Pr., PS 635.  
Brillouin Zones, cohesive energy, interaction of electrons with electromagnetic radiation interactions between electrons and the crystal lattice.
637. **Solid State Physics III (3).** Pr., PS 636.  
Magnetic properties of solids; para-, dia-, ferro-, and antiferromagnetic effects. Resonance experiments, optical properties of solids.
639. **Directed Reading in Physics (2).** Pr., permission of instructor. (May be taken more than one quarter.)
641. **Quantum Mechanics I (3).** Pr., PS 402.  
Action principle; Schrödinger's equation; operator formalism; bound state problems; angular momentum.
642. **Quantum Mechanics II (3).** Pr., PS 641.  
Transformation theory; perturbation calculations; particle in electromagnetic field; radiative transitions.
643. **Quantum Mechanics III (3).** Pr., PS 642.  
Scattering theory; S matrix; identical particles; applications.
- 644-5. **Advanced Quantum Mechanics I-II (3-3).** Pr., PS 632, or PS 643.  
Dirac electron; field quantization; interactions; Feynmann diagrams; dispersion relations.
653. **Seminar in Physics (2).** Pr., permission of instructor. (May be taken more than one quarter.)
655. **Special Topics in Theoretical Physics (3).** Pr., permission of instructor.  
Choice of topic will vary but will include: relativity theory; group theory; atomic and molecular structure; elasticity; fluid mechanics; quantum field theory; low temperature physics. (May be taken more than one quarter.)
661. **Nuclear Structure (3).** Pr., PS 405, PS 643.  
Selected topics on properties of nuclei.
662. **Nuclear Processes (3).** Pr., PS 661.  
Radioactive decay, nuclear reactions.
- 671-72. **Advanced Solid State Theory I and II (3-3).** Pr., PS 637.  
Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory, Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of superconductivity, ferromagnetism, and other cooperative phenomena.

691. Directed Reading in Contemporary Physics. (Credit to be arranged.) Pr., completion of 30 hours of advanced courses in physics. (May be taken more than one quarter.)
699. Research and Thesis. (Credit to be arranged.)
799. Research and Dissertation. (Credit to be arranged.)

### Political Science (PO)

*Head Professor Fortenberry*

*Professors Boyne and Hayhurst*

*Associate Professors Dickson, Johnson, and Nunn*

*Assistant Professors McNorton, Metzger, and Pickering*

*Instructors Kitchin, Kyper, and Latimer*

209. **Introduction to American Government (5).**  
Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
210. **American State and Local Government (5).**  
State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
309. **Introduction to International Relations (5). Pr., sophomore standing.**  
International relations, including a consideration of the bases of national power and the rudiments of international politics.
312. **An Introduction to Comparative Government (5). Pr., sophomore standing.**  
Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship, contemporary political systems in selected countries will be used for comparison.
313. **The Governments of Latin American Republics (5). Pr., sophomore standing.**  
The functioning of the political systems in the twenty Latin American Republics with emphasis upon the dynamic factors which determine how they operate.
319. **Soviet Foreign Policy (5). Pr., sophomore standing.**  
The factors affecting Soviet foreign policy decision making with special emphasis on (1) theory and practice of world communism, and, (2) the techniques of Soviet penetration in foreign areas.
323. **Municipal Government in the United States (5). Pr., sophomore standing.**  
Functions of city government, relation of city to state; electorate, party system and popular control; forms of government; administrative organization; some reference to Alabama.
325. **Introduction to Public Administration (5). Pr., sophomore standing.**  
Study of organization, development, procedures, process, and human factors involved in administration in a political environment.
327. **Policy and Administration (5). Pr., sophomore standing.**  
Resources in the American economy; consideration of constitutional, political and geographic factors in the development of resources; policy; organization, procedures, and programs for administration and development of natural resources.
329. **The Executive (5). Pr., sophomore standing.**  
The American presidency and state governorships with a view toward analyzing the political dynamics of chief executives and their relationships to the competitive branches and units of government within the American political system.
331. **The Legislative Process (5). Pr., PO 206 or 209 or 210 and sophomore standing.**  
The principles, procedures, and problems of lawmaking in the United States; special attention to Congress and the state legislatures.
332. **The Judicial Process (5). Pr., sophomore standing.**  
The role of the courts, the nature of jurisprudence; comparative legal systems; the origin of law; and the concept of legality.
340. **Political Parties and Politics (5). Pr., sophomore standing.**  
The nature, organization, and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.
401. **American Constitutional Law I (5). Pr., junior standing.**  
The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining the judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.
402. **American Constitutional Law II (5). Pr., junior standing.**  
The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.



405. **Metropolitan Area Governmental Problems (5). Pr., junior standing.**  
Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
407. **Political Science (5). Pr., PO 206 or 209 and junior standing.**  
The nature, scope, and methods of political science; the origin, forms, and functions of the state, with special emphasis on the development of political theory.
415. **Public Personnel Administration (5). Pr., junior standing.**  
Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
418. **Administrative Law (5). Pr., junior standing.**  
General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review. Case method.
419. **Southern Politics (5). PO 206 or PO 209 and 210 and junior standing.**  
Regional politics emphasizing case studies, voting patterns, political strategy, current political groups and factionalism, taught from the viewpoint of political science rather than history.
420. **Political Thought Before the Nineteenth Century (5). Pr., junior standing.**  
The development of political thought from the Greeks to 1800; attention to the philosophers and the early theories that are found in modern political institutions.
422. **Recent and Contemporary Political Theory (5). Pr., junior standing.**  
The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
424. **American Political Thought (5). Pr., junior standing.**  
The principal American political philosophers and philosophies and their influence on political institutions.
426. **Governments of Europe (5). Pr., junior standing.**  
Governments, political structure and power systems with particular emphasis upon Great Britain and Soviet Russia, and consideration of France, Germany and Italy.
430. **American Foreign Policy (5). Pr., junior standing.**  
An analysis of American foreign policy decision making and practices with special emphasis on (1) recent and contemporary trends and developments and (2) the economic aspects of international politics.
431. **National Security Policy (3). Pr., junior standing.**  
Descriptions and analyses of the origin, content, and development of security policies historically; assessment of contemporary challenges, security concepts, and strategies.
432. **Military Affairs and Foreign Policy (5). Pr., junior standing.**  
Examination of the historical role of force as an instrument of policy and its contemporary efficacy; analyses of civil-military relationships, constitutional and social controls, and the implications of modern total war.
435. **Contemporary International Politics (5). Pr., junior standing.**  
A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
440. **Introduction to International Law (5). Pr., junior standing.**  
The origin and development of international law with special emphasis on recent and current developments—trends.
445. **The Government and Politics of the Developing Nations (5). Pr., junior standing.**  
The problems involved in creating stable political systems in underdeveloped and recently colonial countries. Selected countries of this type will be used for comparison.

#### GRADUATE COURSES

602. **Interdisciplinary Seminar (5). Pr., permission of instructor.**  
Descriptions and analyses of the basic elements of planning from the fields of Agriculture, Architecture, Arts and Sciences, Business, Education, and Engineering within the context of political instruments and processes involved in achieving planning objectives.
611. **Seminar in American Government (3-5).**  
A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.
613. **Seminar in State and Local Government (3-5).**  
A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.
625. **Seminar in Political Parties, Pressure Groups and Political Issues in the United States (5). Pr., junior standing.**  
The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.
635. **Seminar in Public Administration (5).**  
Various processes, functions, theories, practices and systems as treated in the literature of public administration.

**645. Seminar in Comparative Government (5).**

The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.

**655. Seminar in International Relations (5).**

The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.

**665. Seminar in Political Theory (3-5).**

The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.

**675. Seminar in Constitutional Law (5).**

Selected areas of constitutional law with readings in depth in relevant cases and constitutional theory.

## Poultry Science (PH)

*Professors Moore, Cottier, Edgar, and Mora*  
*Associate Professors Goodman, Johnson, and McDaniel*  
*Assistant Professor Brewer*

**301. General Poultry Husbandry (5). Lec. 4, Lab. 2. Fall, Winter, Spring, Summer.**

Principles of poultry production and their application to general farm conditions, including breeding, feeding, housing, diseases, and culling.

**302. Poultry Meat Production (3). Lec. 2, Lab. 2. Fall. Pr., PH 301.**

Practical problems involved in raising broilers, capons, and turkeys for meat production.

**404. Poultry Management (5). Lec. 4, Lab. 2. Spring. Pr., PH 301 and junior standing.**

Poultry problems and management of commercial flocks.

**405. Poultry Feeding (3). Fall. Pr., PH 301 and junior standing.**

Composition and use of poultry feeds in connection with the demands for growth, body maintenance, and egg production.

**406. Incubation and Brooding (3). Lec. 2, Lab. 2. Winter. Pr., PH 301 and junior standing.**

Embryology of the chick, theory and practice of incubation and brooding.

**407-09. Poultry Problems (3-3). Lec. 1, Lab. 4. Pr., 12 hours PH courses and junior standing. All quarters.**

Investigation on some phase of poultry work.

**408. Poultry Diseases and Parasites (5). Lec. 4, Lab. 2. Winter. Pr., PH 301 and junior standing.**

Prevention, diagnosis, control, and treatment of the common diseases and parasites of poultry, designed especially for Agriculture students.

**410. Poultry Breeding (3). Lec. 3. Spring. Pr., PH 301, ZY 300, and junior standing.**

Physiology of reproduction and inheritance of various poultry characters responsible for efficient egg and meat production and low mortality.

**411. Poultry Marketing (3). Lec. 2, Lab. 2. Spring. Pr., PH 301 and junior standing.**

Grading eggs and poultry and study of problems of poultry marketing.

**412. Commercial Poultry Management (3). Lec. 4. Pr., graduate standing.**

Management practices and principles used in the business of producing market eggs, hatching eggs, broilers, and turkeys. (Credit for both PH 404 and PH 412 may not be used in meeting the requirements for the Master's degree.)

**413. Poultry Sanitation and Diseases (3). Lec. 4. Pr., graduate standing.**

Recommended sanitation practices and the prevention and control of common diseases and parasites of poultry. (Credit for both PH 408 and PH 413 may not be used in meeting requirements for the Master's degree.)

**414. Environmental Physiology and Bioengineering (5). Lec. 3, Lab. 4. Winter. Pr., ZY 424 or AN 302 or equivalent; senior standing; and consent of instructors.**

(This is the same course as AN 414.)

Practices and theories of environmental engineering and science directly applicable to animal environments. Physiological responses of animals to various environmental parameters.

**422. Avian Diseases (5). Lec. 4, Lab. 2. Fall.**

Diagnosis, treatment, and prevention of infectious and parasitic diseases. Clinical and autopsy demonstrations are performed during laboratory periods. (For Veterinary students only.)

## GRADUATE COURSES

**504. Advanced Poultry Production (5). Lec. 5. Spring.**

Advanced studies on various phases of poultry production.

606. **Advanced Poultry Breeding (5).** Lec. 4, Lab. 2. Fall.  
Advanced studies of the principles of heredity as applied to poultry breeding.
607. **Advanced Poultry Problems (2 to 5).** All quarters. (May be taken more than once to a maximum of 5 hrs.)  
Assigned problems.
608. **Seminar. Credit to be arranged.** Fall, Spring, Winter, Summer.  
Literature in Poultry Husbandry and other fields related to poultry. Emphasis will be given to the preparation, organization and presentation of research material by students and to reporting of current literature in the field. Designed for seniors in Poultry or Animal Husbandry as well as graduate students.
610. **Advanced Poultry Nutrition (5).** Lec. 5. Summer.  
Advanced study of the nutrients, their function and the nutritional requirements of poultry.
611. **Advanced Poultry Management (5).** Lec. 5. Summer.  
Advanced study of the principles of management of commercial poultry flocks.
612. **Advanced Poultry Diseases (5).** Lec. 1, Lab. 8. Spring. Pr., PH 408 or consent of instructor.  
Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
613. **Advanced Poultry Diseases (5).** Lec. 1, Lab. 8. Summer. Pr., VM 418 and PH 612, or equivalent.  
Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
614. **Immunochemistry (5).** Lec. 3, Lab. 4. Fall. Pr., general bacteriology, immunology and organic or biochemistry.  
Advanced study of the fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.
615. **Avian Physiology (5).** Fall. Pr., ZY 424 and organic chemistry.  
General physiology of birds with particular reference to domesticated species.
618. **Experimental Virology (5).** Lec. 3, Lab. 4. Winter. Pr., VM 461, VM 495, CH 208, CH 420 or equivalent and permission of instructor.  
Advanced study of fundamental properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses; identification of anti-viral agents using in vitro systems.
625. **Digestive and Renal Physiology (5).** Spring. Pr., ZY 424 and organic chemistry.  
Review of the digestive and renal physiology of mammalian and avian species with special reference to body fluid homeostasis.
699. **Research and Thesis.** (Credit to be arranged.) All quarters.  
Technical laboratory problems related to poultry.
799. **Doctoral Research and Dissertation.** (Credit to be arranged.) All quarters.

## Psychology (PG)

*Head Professor Spears*

*Professors Jenkins and McIntyre*

*Associate Professors Foshee, Irvine, Lair, Moon, and Turner*

*Assistant Professors Cahoon, Smith, Vallery, and Williams*

*Research Lecturer McKee*

211. **Psychology I (3).**  
Human behavior emphasizing principles of learning, perception, and motivation.
212. **Psychology II (3 cr.).** Prerequisite PG 211.  
Continuation of PG 211 emphasizing the development of human behavior.
215. **Quantitative Methods in Psychology (4).** Pr., MH 161, PG 211.  
Introduction to the measurement of behavior and to quantitative methods of data analysis.
320. **Experimental Psychology I: Learning (4).** Lec. 3, Lab. 3. Pr., PG 212, 215 (PG 215 may be taken concurrently).  
Experimental analysis of behavior modification emphasizing problems, concepts, and methods.
321. **Experimental Psychology II: Perception (4).** Lec. 3, Lab. 3. Pr., PG 212, 215 (PG 215 may be taken concurrently).  
Discrimination, generalization, and their physical and physiological correlates.
322. **Experimental Psychology III: Personality (4).** Lec. 3, Lab. 3. Pr., PG 320.  
Motivation, cognitive processes, and adaptive behavior.

330. **Social Psychology (4). Lec. 3, Lab. 2. Pr., PG 212 or SY 203.**  
Analysis of social behavior including roles, group identification, attitudes, and conflicts among these.
360. **Fields of Professional Psychology (5).**  
Contributions of psychology to medicine, education, law, and human engineering in industry. Not open to students majoring in Psychology.
415. **Psychological Testing (5). Pr., junior standing and PG 322, or departmental approval.**  
Theory of psychological testing with application to the measurement of aptitudes and various aspects of personality.
430. **Perception (4). Pr., junior standing and PG 321, PG 322 or departmental approval.**  
Theories of perception, emphasizing both general and individual factors that influence meaning.
431. **Social Psychology (5). Pr., 15 hours of psychology and junior standing.**  
Theories of social behavior; processes of social influence; group structure and dynamics; influence of basic psychological processes on social behavior.
433. **Personality (4). Pr., junior standing and PG 322 or departmental approval.**  
Objective, phenomenological, and psychoanalytic theories of personality.
435. **Behavior Pathology (4). Pr., junior standing and PG 322 or departmental approval.**  
Types of abnormal behavior and their social and biological origins.
440. **Physiological Psychology (5). Pr., junior standing and 20 hours of biological sciences, or departmental approval.**  
The physiological correlates of behavior, including sensory and response mechanisms, with special emphasis on central nervous system function.
445. **Animal Behavior (5). Pr., junior standing and 20 hours of biological sciences, or departmental approval.**  
Analysis of unlearned and learned animal behavior and its evolutionary development, integrating the contributions of ethological and behavioristic research.
450. **Learning (4). Pr., junior standing and PG 320 or departmental approval.**  
Theories of learning and their logical and empirical foundations.
461. **Industrial Psychology (5). Pr., junior standing.**  
The uses of psychology in business and industry.
462. **Training and Supervision of Industrial Personnel (3). Pr., junior standing.**  
Application of the principles of learning to the training of factory, office, and sales employees.
463. **Interviewing and Classifying Industrial Personnel (3). Pr., junior standing.**  
Principles and practices in interviewing.
480. **History of Psychology (4). Pr., junior standing and 20 hours psychology or departmental approval.**  
Evolution of psychology from physics, physiology, and philosophy to a science of behavior.
490. **Special Problems in Psychology (3 to 8; may be repeated for maximum of 8 hours). Pr., junior standing, departmental approval.**  
An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest.

#### GRADUATE COURSES

- 600-601. **Behavior Theory I, II (5-5). Pr., 20 hours of experimental and theoretical psychology and departmental approval; 600 for 601.**  
Survey of current theory in psychology and introduction to theory construction.
611. **Theory of Measurement (5). Pr., PG 415, PG 625, and departmental approval.**  
Statistical theory of error and true values; scaling methods.
620. **Experimental Psychology I: Learning (5). Lec. 3, Lab. 6. Pr., PG 215 and PG 320 or PG 450.**  
Analysis of learning stressing experimental methodologies illustrative of major theoretical approaches.
621. **Experimental Psychology II: Psychophysics (5). Lec. 3, Lab. 6. Pr., 20 hours of experimental and theoretical psychology.**  
Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
622. **Experimental Psychology III: Personality-Social (5). Lec. 3, Lab. 6. Pr., PG 601.**  
Experimental studies of complex processes in humans.
623. **Analysis of Behavior (5). Lec. 2, Lab. 10. Pr., PG 620.**  
Methods and concepts of operant conditioning research with animals and humans stressing current research and literature.

625. **Experimental Design I (5).** Pr., PG 215 and PG 320.  
Analysis of variance, expected mean squares, and correlation methods.
626. **Experimental Design II (5).** Pr., PG 625 and 620, 621, or 622.  
Advanced topics in variance and multivariate analysis relating to research design.
631. **Social Psychology (5).** Pr., PG 431.  
Major systems and theories relating to social psychology, including *Gestalt*, reinforcement, psychoanalytic, role and field theory.
635. **Theories of Personality (5).** Pr., PG 433 and 601.  
Continuation of PG 433 emphasizing analysis of current issues.
637. **Behavior Pathology (5).** Pr., PG 435, 635, and permission of instructor.  
Continuation of PG 435 emphasizing current theoretical conceptions and research in psychopathology.
640. **Physiological Psychology (5).** Lec. 2, Lab. 10. Pr., PG 621.  
Relation to physiological and anatomical, particularly neuroanatomical, variables to the organism's capacity to respond to stimulation.
645. **Comparative Psychology (5).** Lec. 2, Lab. 10. Pr., PG 623, 625, and 640.  
Analysis of intra- and inter-species behavior emphasizing physical and physiological uniquenesses, response comparability, and generalizability of behavioral principles.
650. **Theories of Learning (5).** Pr., PG 450 and 601.  
Continuation of PG 450 emphasizing analysis of current issues.
670. **Individual Testing (5).** Lec. 2, Lab. 10. Pr., PG 415 and departmental approval.  
Supervised practice in the administration and interpretation of individual intelligence tests.
671. **Personality Assessment I (5).** Lec. 3, Lab. 6. Pr., PG 670 and departmental approval.  
Theory and application of methods of personality measurement with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.
672. **Personality Assessment II (5).** Lec. 3, Lab. 6. Pr., PG 671 and departmental approval.  
Theory and application of methods of personality measurement with emphasis on projective techniques.
673. **Personality Assessment III.** Credit to be arranged. (Maximum of five hours credit may be applied to minimum requirements for Master's degree.)  
Supervised practicum in personality assessment.
675. **Objective Techniques of Assessment (5).** Pr., PG 415 and 433.  
Administration and interpretation of objective measures of aptitudes, performance, and personality.
680. **Current Research in Psychology (2).** May be repeated for a maximum of 10 hours of credit. Pr., permission of the instructor.  
Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students.
690. **Seminar.** Credit to be arranged. May be taken more than one quarter.  
Topics for advanced students, chosen according to need.
692. **Research in Special Topics.** Credit to be arranged. May be taken more than one quarter.
699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.
799. **Research and Dissertation.** Credit to be arranged. May be taken more than one quarter.

## Secondary Education (SED)

*Head Professor Atkins*

*Professors Davis, Herndon, and Scheid*

*Associate Professors Easterday, Justice, Weaver, and Whitaker*

*Assistant Professors Alley, Ensminger, Graves, Miles, Robertson, Shell, and Yielding*

*Instructors Baxter\*, Creekmore\*, Curlington\*, and Deen\**

## Undergraduate

### 102. Orientation (1).

Helps transfers from other curricula and students enrolled in other schools to understand teacher education and teaching as a profession. (Students sectioned by area of specialization.) (A) Art, (B) Business Education, (C) Dramatic Arts, (D) Foreign Languages, (E) Home Economics, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.

\*Temporary.

- 103. Orientation (1).**  
Helps freshmen in planning their professional careers. (Students sectioned by area of specialization.) (A) Art, (B) Business Education, (C) Dramatic Arts, (D) Foreign Languages, (F) Home Economics, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.
- 104. Introduction to Laboratory Experiences (1).**  
Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program. (Students sectioned by area of specialization.) (A) Art, (B) Business Education, (C) Dramatic Arts, (D) Foreign Languages, (F) Home Economics, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.
- 201. Education (2).**  
Designed to help prospective teachers in the guidance of students. (A) Art Expression, (J) Music Experiences, (P) Communication Problems, (Q) Materials of Instruction, (R) Improvement in Reading.
- 201L. Education (1). Lab. 2.**  
Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.

### Curriculum and Teaching

Undergraduate students in secondary education with a teaching major and minor in secondary education only will take one course in Teaching and one course in Program in the major field and one course in either Teaching or Program in the minor field.

Students in secondary education may pursue a curriculum leading to certification for teaching in selected subject-matter fields in both the elementary and the secondary school. When this type program is pursued, certification requires that the student complete both the Teaching and the Program courses in the teaching field or fields in which certification is expected. Teaching fields for the twelve-grade program include health, physical education and recreation, industrial arts, and the subject-matter areas listed under Interdepartmental.

Teaching and Program courses may be scheduled and taught as separate courses, related courses, or as a unified program.

- 405. Teaching in Secondary School (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.**  
(B) Business Education (Fall); (D) Foreign Languages (Fall); (G) English Language Arts (Fall, Spring); (H) Mathematics (Fall); (K) Science (Fall); (L) Social Science (Fall, Winter, Spring).
- 407. Teaching Home Economics Education (5). Lec. 4, Lab. 2. Fall, Spring. Pr., FED 320, or equivalent.**
- 410. Program in Secondary School (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.**  
(B) Business Education (Spring); (D) Foreign Languages (to be arranged); (G) English Language Arts (Winter, Spring); (H) Mathematics (Spring); (K) Science (Spring); (L) Social Science (Fall, Winter, Spring).
- 412. Program in Home Economics Education (4). Lec. 3, Lab. 2. Fall, Spring. Pr., FED 320, or equivalent.**
- 425. Professional Internship in Secondary School (15). Pr., Sr. standing, Admission to Teacher Education three quarters prior to Internship, minimum of two appropriate Teaching and Program Courses.**  
(B) Business Education, (D) Foreign Languages, (F) Home Economics, (G) English Language Arts, (H) Mathematics, (K) Science, (L) Social Science. (See description under Professional Internship in School of Education section.)

### Advanced Undergraduate and Graduate

- 475. Problems in Improvement of Reading at the Secondary School Level (5). Pr., teaching experience or consent of instructor.**  
Problem areas of effective reading instruction in developmental reading. Grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary, and other related areas in the reading program and in the content areas of the secondary school.
- 494. Organization of Instrumental Music (3). Pr., IED 414.**  
Theory and practice in the organization and administration of instrumental music in public schools.
- 495. Organization of Choral Music (3). Pr., IED 414.**  
Theory and practice in the organization and administration of choral music in public schools.



## Graduate

646. **Studies In Education (1-3).** Pr., one quarter of graduate study. Applies to one of the following areas of the secondary school program:  
(A) Art, (B) Business, (C) Dramatic Arts, (D) Foreign Languages, (F) Home Economics, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, and (S) School Library Science.

649. **The Secondary School Program (5).**

For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.

650. **Seminar.** Credit to be arranged (3-10). May be repeated.

Each of these courses, 651, 652, 653, and 654, applies to the following areas of the secondary school program: (B) Business Education, (D) Foreign Languages, (F) Home Economics Education, (G) English Language Arts, (H) Mathematics, (K) Science, and (L) Social Science.

651. **Research Studies in Education in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.

652. **Curriculum and Teaching in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education. Critical study of teaching practices and reappraisal of selecting experiences and content for curriculum improvement.

653. **Organization of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education. Advanced course. Program, organization and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.

654. **Evaluation of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education. Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization with the total school program and with other educational programs of the community.

Study in other teaching areas including art; dramatic arts; gifted; mental retardation; music; speech; speech correction; health, physical education and recreation; and industrial arts is available also to students in secondary education.

- 659-660. **Practicum in Area of Specialization (5-5).** Pr., Master's Degree or equivalent in Education and permission of major professor.

The practicum provides advanced graduate students with supervised experience with emphasis on the application of concepts, principles, and skills acquired in previous course work.

## Science

## Undergraduate

453. **Science and Modern Living (5).** Lec. 4, Lab. 2. Pr., junior standing.

Interpretative course stressing the relationship of science to problems of personal and social living in modern technological society. The critical role of science in democracy.

473. **General Science for Teachers (5).** Lec. 4, Lab. 2. Pr., junior standing.

Gives the teacher essential knowledge of such fields as earth science, meteorology, astronomy, nuclear energy, which constitute significant aspects of the general science program.

## Graduate

- 640-641. **Advanced Study of High School General Science.** Pr., SED 473.

Intensive study of selected topics from the area of the high school general science program.

For advanced courses in curriculum, school library science, higher education, and research and dissertation, see IED.

699. **Thesis Research.** (Credit to be arranged.) (May be taken more than one quarter.)

## Sociology (SY)

*Acting Head Professor Hartwig*

*Associate Professor Shields*

*Assistant Professor Vanlandingham*

*Instructors Arnold, Cardwell, Carson, French\*, and MacKenzie*

201. **Introduction to Sociology (5).** Pr., sophomore standing and qualified third quarter freshman with departmental approval.  
Principles and processes influencing the social life of man.
202. **Social Problems (5).** Pr., SY 201.  
Current social problems with special reference to the socially inadequate.
203. **Cultural Anthropology (5).** Pr., sophomore standing.  
Nature of culture, using materials taken from scientific studies of societies.
204. **Social Behavior (5).** Pr., SY 201 or PG 211.  
Integrated social-anthropological, biological, and psychological factors which influence or determine human behavior; the emphasis is upon the normal average individual and/or group situations.
205. **Preparation for Marriage (3).** General elective. Open to freshmen with consent of instructor.  
Basic factors in dating courtship, mate selection and engagement in preparation for marriage and family living.
207. **Introductory Archaeology (5).** Pr., SY 201 or SY 203.  
The history, principles, and methods for investigating and reconstructing past cultures.
220. **Statistics (5).** Pr., SY 201.  
Basic statistical concepts, measures, and techniques used in sociological reports and research.
301. **Sociology of the Family (5).** Pr., SY 201 and junior standing.  
The family in contemporary society.
302. **Criminology (5).** Pr., SY 201 and junior standing.  
The causes of crime and its social treatment. Field trips required.
303. **History of Anthropology (5).** Pr., SY 203.  
The development of anthropological thought from functionalism and evolutionism to culture and personality research and whole-culture analysis.
304. **Minority Groups (5).** Pr., junior standing.  
Racial composition of the United States with special emphasis upon the adjustment of minority groups to the culture.
305. **Culture and Personality (3).** Pr., SY 201.  
Socio-cultural factors in personality development and recent studies in national character.
306. **Penology (5).** Pr., junior standing and SY 302.  
The history and development of corrections with particular emphasis upon modern rehabilitative processes.
308. **Juvenile Delinquency (5).** Pr., SY 201.  
Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with this problem.
309. **Social Thought (5).** Pr., junior standing and SY 201 or consent of instructor.  
Significant social thought leading to the emergence of modern sociological theory.
310. **Social Organization (5).** Alternate years. Pr., SY 201 or consent of instructor.  
Structure and stratification of society. The contemporary scene is emphasized.
311. **Technology and Social Change (3).** General elective. Pr., junior standing.  
Relationship between technological development and changes in modern society. Special emphasis placed upon the human relations aspects of modern science. Designed primarily to meet social science needs of students in the fields of engineering, agriculture, education, and the physical sciences.
312. **Marriage Adjustments (3).** General elective. Pr., junior standing.  
Emotional, social and biological factors in the family setting with emphasis upon adjustments of marriage and parenthood.
370. **Methods of Social Research (5).** Pr., SY 201 or AS 361.  
The principal methods of data collection and analysis in sociological research. Same course as AS 370. Credit in AS 370 excludes credit in SY 370.
401. **Population Problems (5).** Pr., senior standing.  
Problems of quantity and quality of population including problems of composition, distribution and migration. Attention is given to Alabama population.

\*Temporary.

402. **Social Theory (5).** Pr., SY 201 or consent of instructor; senior or graduate standing.  
The range of contemporary social theory.
403. **Contemporary Anthropology (5).** Pr., SY 203, junior standing.  
Contemporary primitive, traditional and urban cultures, and recent research in culture change.
404. **Sociology of Power (5).** Pr., SY 201, junior standing.  
A systematic concern with the dimensions and distribution of power in social life.
405. **Urban Sociology (5).** Pr., senior standing.  
Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.
406. **Introduction to Social Welfare (5).** Pr., senior standing.  
The social welfare field, including social case work. Primarily for students planning a career in the social welfare or related fields.
407. **Public Opinion and Propaganda (5).** Pr., junior standing, SY 201.  
The area of social communication; the formation, place and importance of publics in modern society, of public opinion research, and of propaganda and public relations techniques.
408. **Industrial Sociology (5).** Pr., junior standing, SY 201.  
The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.
409. **Sociology of Religion (5).** Pr., SY 201, senior standing, or consent of instructor.  
Analysis of religion as a social institution as found in the world's great religions. (To be offered in alternate years.)
410. **Sociology of Knowledge (5).** Pr., SY 201 or consent of instructor.  
A review of sociological approaches to the understanding of human knowledge; a tracing of connections between knowledge and other facets of the sociocultural context.
414. **Field Instruction (5).** Pr., junior standing and consent of instructor.  
Supplementary instruction concurrent with field experience in some field of work involving application of sociological perspectives to community life.

#### GRADUATE COURSES

602. **Seminar in the Family (5).** Pr., SY 301 or HE 304 or consent of instructor.  
Advanced institutional nature of marriage and the family with particular emphasis upon the changing practices and notions in marital relationships as related to changes in the structure and functions of the family.
603. **Social Problems (5).** Pr., SY 202 and consent of instructor.  
Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.
604. **Seminar in Race and Culture (5).** Pr., SY 201 and SY 304 or consent of instructor.  
Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.
608. **Organizational Analysis (5).**  
A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.
650. **Sociology Seminar.** Not to exceed 10 hrs. Pr., graduate standing or consent of instructor.  
Designed for students engaged in intensive study and analysis of sociological subject areas. NOTE: AS 461 and AS 462 are open to sociology majors; see Department of Agricultural Economics and Rural Sociology course offerings.

#### Speech (SP)

*Head Professor Davis*

*Professors Ranney and Smith*

*Associate Professor Richardson*

*Assistant Professors Gray, Moore, J. Ouzts, Phillips, and Sanders*

*Instructors Daniel, Larka, F. Ouzts*

#### a. Fundamentals

101. **Listening Improvement (1).** Lec. 1, Lab. 1.  
Developmental listening for students who wish to improve their skill in this area.
200. **Survey of the Bases of Speech (5).**  
Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological and other bases.

**201. Introduction to Oral Communication (5).**

The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.

**202. Applied Oral Communication (3). Lec. 2, Lab. 3.**

To improve the efficiency and effectiveness of oral communication by covering the human organism as an oral communicator, the process of transmission and reception of information, the process of behavioral change and the ethical responsibilities involved.

**300. The Speech and Hearing Mechanism (5).**

Anatomy and physiology of the speech and hearing mechanism.

**301. Phonetics (3). Lec. 2, Lab. 2.**

Principles of phonetics and their application to speech.

**401. Psychology of Communication (5). Pr., junior standing, PG 211 or 213 and PG 330.**

Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning. Small groups and audience behavior and psychological studies in various areas of communication situations.

**601. Introduction to Graduate Study in Speech (5).**

Exploration of areas in which research is needed; resources available; methods of research in speech; structuring the research problem; presenting the results of research in speech.

**602. Seminar: Studies in Communication Theory (5). Pr., SP 201, 401, or equivalent.**

Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.

**603. Measurement in Communication Research (3).**

Response measurement techniques and their application to behavioral research in communication. Particular attention is given to the measurement of various electrophysiological phenomena.

**607. Independent Study (1-5). (Course may be repeated not to exceed 10 hours credit.)**

A. Public Address; B. Interpretation; C. Radio and Television; D. Group Methods; E. Speech Pathology; F. Audiology. Conferences, readings, research, and reports in one of the listed areas.

**699. Thesis. (Credit to be arranged.)****b. Public Address****310. Great American Speeches (3). All quarters. General elective.**

Critical study and comparison of representative outstanding American speeches; the issues with which they were identified; their relation to the social scene.

**311. Advanced Public Speaking (5). Pr., SP 202 or by consent of instructor.**

Structure, style, and delivery of various types of speeches for different occasions, speeches to inform, to persuade, and to entertain. Theory and study of current examples combined with practice.

**411. Persuasive Speaking (5). Pr., junior standing and SP 202 or consent of instructor.**

Influencing individuals and audiences by means of spoken appeals. Salesmanship speaking. Analysis of forces which led to belief and action. Practice in organizing and presenting such appeals.

**610-11. History and Development of Rhetorical Theory I, II (5-5). Pr., consent of instructor.**

Advanced studies in the historical development of writings, men and movements. Materials selected from the periods: A. Ancient and Medieval; B. Renaissance and Modern.

**615. Rhetorical Criticism (5). Pr., consent of instructor.**

The history and method of rhetorical criticism. Application of critical standards to selected men and their work.

**c. Interpretation****220. Fundamentals of Oral Interpretation of Literature (5). All quarters.**

Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.

**421. Oral Interpretation of Prose and Drama (5). Pr., junior standing and SP 220 or consent of instructor.**

Develops skill in the oral reading of prose and drama. Study of theories concerning the sound, sense and performance of these two types of literature.

**422. Oral Interpretation of Poetry (5). Pr., junior standing and SP 220 or consent of instructor.**

Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.

620. **The History and Theory of Interpretation (5).**  
The growth and change of theories regarding oral interpretation.

#### d. Television-Radio-Film

230. **Introduction to Broadcasting (5).**  
The history, growth and development of broadcast communications and the legal, social and political aspects of broadcasting.
232. **Broadcast Instrumentation (3).**  
Basic principles in the reproduction of sound and pictures, familiarization with the electronic characteristics of basic equipment in television, radio and film.
234. **Broadcast Production Techniques—Radio (5).** Pr., SP 232 or permission.  
Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing and crewing radio productions and taped material.
235. **Modes of Film Communication (5).**  
The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education and art.
236. **Broadcast Production Techniques—Television (5).** Pr., SP 232 or permission.  
Practice in writing, producing, directing, performing and crewing television productions and video-tape materials.
238. **Broadcast Speech (3).** Pr., SP 202 or permission.  
Introduction to the responsibilities and skills required of the individual performer in the preparation, announcing and narration of various types of non-dramatic material for television and radio.
334. **Advanced Radio Broadcasting (5).** Pr., junior standing and SP 234 or consent of instructor.  
Continuation of SP 234. Advanced course in announcing techniques, program organization, audience analysis, recording sound effects, directing.
335. **Development of the Film (5).** Pr., 235 or permission.  
The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.
336. **Television Production—Direction I (5).** Pr., SP 236 or permission.  
Individual and group projects in the development and production of programs and formats; an intense study of directing theory and the director's role through presentation of educational and dramatic materials.
338. **Broadcast News Writing (5).** Pr., junior standing and permission.  
Writing and editing news and informational material for television and radio. Students solicit and prepare news from and for local sources.
436. **Television Production—Direction II (5).** Pr., junior standing and SP 336.  
Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.
438. **Television—Radio—Film Writing (5).** Pr., junior standing and permission.  
The technique of writing dramatic and non-dramatic material for television, radio and films. Special emphasis is placed on performance. Students may elect to emphasize one area.
439. **Broadcasting in Education (5).** Pr., junior standing.  
The uses, problems, potentialities and current developments in educational broadcasting with special emphasis on instructional and educational television.
630. **Studies in Radio, Television and Film (5).** Pr., consent of instructor.  
Combined media and their relationship with speech and communication.
631. **History of American Broadcasting (5).** Pr., consent of instructor.  
The origin of radio and television broadcasting and its development to the present day.
632. **Broadcast Programming and Criticism (5).** Pr., consent of instructor.  
The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.
633. **Broadcast Regulations (5).**  
The social and political control of broadcasting by agencies, groups, and organizations through legal, social and economic means.

#### e. Speech Pathology and Audiology

##### (Speech Pathology)

950. **Speech Improvement (5 hr. Lab.—non-credit).** May be repeated.  
Encourages the individual development and use of an acceptable pattern of speech with special attention to intelligibility, pronunciation, intensity, sound discrimination, voice quality and the objective attitude.

355. **Clinical Procedures in Speech (1-3). Course may be repeated.**  
Orientation and an introduction to supervised clinical activity in the area of speech disorders. Clinical practice required.
450. **Principles of Speech Correction (5). Pr., junior standing.**  
Not open to students emphasizing or majoring in speech correction and audiology. Basic principles underlying a speech correction program in a school setting. Description and discussion of speech disorders; surveys and identification techniques.
451. **Speech Correction I (5). Pr., junior standing and SP 355 or consent of instructor. For Speech Majors.**  
The nature of the speech correction process with emphasis on disorders of articulation. Participation in clinic activities required.
452. **Speech Correction II (5). Pr., junior standing and SP 451 or consent of instructor.**  
Continuation of SP 451 with emphasis on vocal disorders and disorders of rhythm. Participation in clinic activities required.
453. **Speech Correction III (5). Pr., junior standing and SP 452 or consent of instructor.**  
Emphasis on disorders of symbolization and delayed language development. Participation in clinic activities required.
650. **Speech Pathology (5). Pr., SP 453 or consent of instructor. May be repeated.**  
Advanced studies dealing with disorders of speech. Materials may be drawn from: A. cerebral disturbances (aphasia and cerebral palsy); B. palatolaryngeal disturbances (nasopharyngeal and cleft palate); C. voice disorders; D. stuttering; E. articulation (including dialect); F. delayed speech development.
655. **Clinical Problems in Speech (1-3). Pr., SP 453 or equivalent. The course may be repeated.**  
Methods, techniques, and clinical management of the disorders of speech. Clinical practice required.

### (Audiology)

365. **Clinical Procedures in Hearing (1-3).**  
Orientation and an introduction to supervised clinical activity in the area of hearing disorders. Clinical practice required.
460. **Introduction to Problems in Hearing (5). Pr., junior standing.**  
Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing. Clinical observation.
461. **Hearing Pathology (5). Pr., SP 460 or equivalent.**  
Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and auditory training. Clinical practice.
462. **Hearing Rehabilitation (5). Pr., junior standing, SP 461 or consent of instructor.**  
Detailed concern for the rehabilitation problems of children and adults in the areas of auditory training, speech reading and speech conservation. Clinical practice.
660. **Audiology (5). Pr., SP 460 or consent of instructor. May be repeated.**  
Advanced studies dealing with the disorders of hearing. Materials drawn from: A. speech reading; B. auditory training; C. hearing testing and measurement; D. child and adult rehabilitation; E. hearing aids and hearing aid evaluation; F. education of the deaf.
665. **Clinical Problems in Hearing (1-3). Pr., SP 460, 461, or equivalent. The course may be repeated.**  
Methods, techniques, and clinical management of the disorders of hearing. Clinical practice required.

### F. Group Methods

270. **Group Leadership (3). All quarters. General elective.**  
Nature and functions of group leadership; the role of democratic leadership in organizing and conducting a group meeting to reach group aims. Students gain leadership experience in class activities to help them learn and perfect democratic leadership techniques.
273. **Group Problem Solving Through Discussion (5). All quarters.**  
Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement and a systematic approach to solving problems in group discussion. Leadership in problem solving.
275. **Debate Workshop (1). May be repeated for a maximum of 3 credit hours.**  
Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work.
278. **Argumentation and Debate (5).**  
Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.



371. **Parliamentary Procedure (3).** All quarters. General elective.  
To aid the individual who may lead or participate in discussions or organizations where orderly procedure is needed. Theory and practice both employed.
375. **Debate Workshop (1).** May be repeated for a maximum of 3 credit hours.  
Advanced study of the national debate question for experienced debaters. Analysis of logical, ethical and emotional proofs in competition debate. Lecture and practical work.
473. **Advanced Discussion (5).** Pr., junior standing and SP 273 or consent of instructor.  
The theory and organization of problem-solving discussion and conference groups. Primarily for persons who work with groups.
478. **Advanced Argumentation and Debate (5).** Pr., junior standing and SP 278 or consent of instructor.  
Function of argumentation and debate in a democracy and its application of principles of logic and evidence in past and present public speaking and debating.
673. **Seminar in Discussion (5).** Pr., SP 273 or equivalent.  
Group problem solving through discussion. Includes the survey of published experimental work in discussion and considers the values and limitations of discussion as tools of the democratic leader. Special attention is paid the application of group problem-solving in education, business, industry and agriculture.
678. **Seminar in Debate (1-5).** (May be repeated not to exceed 5 hours credit.)  
Psychological concepts of argument. Techniques and methods employed in argumentative discourse. Critical analysis of selected controversies and a survey of published experimental work in debate.

## Textile Engineering (TE)

*Head Professor Adams*

*Professors Knight and Waters*

*Associate Professors Farrow and Hall*

*Assistant Professors Phillips and Walter*

*Instructor Perkins*

101. **Introduction To Textiles (1).**  
Orientation course for freshmen which briefly introduces all branches of the textile industry.
210. **Fiber Processing (5).** Lec. 4, Lab. 3.  
Construction and operation of equipment for opening, cleaning, blending, picking, carding, combining, drawing; adaptation of these processes to synthetics and wool; calculations necessary for the planning and operation of this equipment.
211. **Yarn Manufacture I (5).** Lec. 4, Lab. 3.  
Construction and operation of roving and spinning equipment for cotton, wool, and synthetics; long draft systems and special drafting, systems for blends, etc.
220. **Weaving and Designing I (5).** Lec. 4, Lab. 3.  
Automatic cam loom mechanism with designing of fabrics made on these looms.
305. **Fiber Technology (3).** Lec. 2, Lab. 3. Pr., sophomore standing.  
Origin, characteristics, and properties of the various textile fibers, both natural and man-made; fiber microscopy.
307. **Bleaching and Dyeing (5).** Lec. 4, Lab. 3.  
Bleaching, dyeing and finishing of natural and man-made fiber fabrics; all types of dyes for textiles, their application and fastness.
317. **Dyeing and Finishing (5).** Lec. 4, Lab. 3. Pr., TE 307.  
Plant application methods and plant problems in dyeing, finishing and printing of natural and man-made fibers.
319. **Chemical Testing (2).** Lec. 1, Lab. 3. Pr., junior standing.  
Procedures and laboratory work on all types of textile tests of a chemical nature; analysis of textile chemicals.
320. **Weaving and Designing II (5).** Lec. 4, Lab. 3. Pr., TE 220.  
Dobby and multibox operation, pattern planning, and designs applicable to dobby and box looms.
321. **Weaving and Designing III (5).** Lec. 4, Lab. 3. Pr., TE 320.  
Special weaving attachments, and production of specialty fabrics. Weaving mill organization. Fabric identification.
322. **Yarn Manufacture II (5).** Lec. 4, Lab. 3. Pr., TE 210 and TE 211.  
Methods of obtaining higher quality yarns; yarn production planning; practical manufacturing problems; yarn mill machinery layout and labor organization.
324. **Physical Testing (3).** Lec. 2, Lab. 3. Pr., junior standing.  
Testing procedures, laboratory use of textile testing equipment and interpretation of data.

325. **Textile Quality Control (2).** Pr., TE 210, TE 211, EC 245; Coreq., TE 324.  
A practical system of textile quality control.
401. **Engineering Aspects of Textile Materials and Processes (5).** Lec. 4, Lab. 3. Pr., senior standing.  
Textile fibers and processes emphasizing the basic engineering elements of each.
405. **Warp Preparation (5).** Lec. 4, Lab. 3. Pr., junior standing.  
Preparation of warp yarn for weaving.
406. **Textile Costing (5).** Pr., junior standing.  
Basic principles for figuring textile production costs; allocation of costs; fabric cost sheet; marketing costs.
412. **Textile Management (3).** Pr., junior standing.  
Analysis of management problems in textile industry including policy determination, job analysis, work loads, training, organization, plant layout, etc.
417. **Advanced Dyeing (5).** Lec. 4, Lab. 3. Pr., TE 317.  
Dyestuff manufacture, shade matching and instrumentation.
418. **Jacquard Weaving and Design (2).** Lec. 1, Lab. 3. Pr., TE 220 and junior standing.  
Jacquard mechanism and design of original patterns for jacquard loom.
424. **Man-Made Fibers I (5).** Pr., junior standing.  
Manufacturing and processing.
425. **Man-Made Fibers II (5).** Pr., TE 422.  
Technological aspects, usage, considerations in the employment of man-made and natural fibers and blends.
431. **Fabric Analysis (3).** Lec. 2, Lab. 3. Pr., TE 320.  
Analysis of fabric structure and determination of specifications.

## Theatre (TH)

*Head Professor Campbell  
Assistant Professor Comeau  
Instructors Erickson and Gibson*

- 101-2-3. **Introduction to the Arts (1).**  
A survey of the arts with emphasis on the interrelation between the various creative areas of Art, Music, Drama, Architecture, etc. from the position of the artist and the observer.
104. **Introduction to Theatre I (3).**  
Theatre as an art form, a broad introduction involving general aesthetics, philosophy, and history.
105. **Introduction to Theatre II (3).**  
A continuation of 104 with special emphasis on analysis of theatre as an art form requiring multiple talent resources.
106. **Introductory Theatre Projects (3).**  
Each student engages in a theatre project which he conceives and effectuates under staff supervision.
107. **Stage Craft I (1).**  
An introduction to technical theatre as the craft of scene construction.
108. **Stage Craft II (1).**  
An introduction to technical theatre as the craft of electronics.
109. **Stage Craft Project (1).**  
Each student engages in a stage craft project which he conceives and effectuates under staff supervision.
199. **Theatre Laboratory (2).**  
General laboratory work (a minimum of 30 hours under staff supervision). A course open to any student interested in working on the theatre season of the Department in any production capacity. May be repeated for maximum credit of six quarter hours.
201. **The Theatre Artist in Society I (3).**  
A historical examination of the role and place in society of the theatre artist with emphasis on recurring problems of orientation and acceptance.
202. **The Theatre Artist in Society II (3).**  
An examination of the role and place in society of the theatre artist in America with emphasis on unionism, professionalism, and educational theatre.
203. **Theories of Acting (3).**  
The theoretical aspects of acting to include writings from the time of Aristotle to the present day.

204. **Fundamentals of Acting I: Voice (5).**  
Developing the voice as a performing instrument.
205. **Fundamentals of Acting II: Movement (5).**  
Developing the body as a performing instrument.
206. **Acting I (5).** Pr., 204, 205, or equivalent.  
A first course in acting involving the skills acquired in 204 and 205 in short acting sequences.
301. **History of Theatre in Western Civilization (3).**  
The theatre as literature, institution, and architecture as it has existed from earliest times to the end of the medieval period.
302. **History of Theatre in Western Civilization (3).** Pr., 301.  
The theatre as literature, institution, and architecture as it has existed in Western culture from the end of the medieval period until the mid-nineteenth century.
303. **History of Theatre in Western Civilization (3).** Pr., 301, 302 or equivalent.  
The theatre as literature, institution, and architecture in Western civilization from the mid-nineteenth century to the present day with emphasis on theatre in America.
304. **Fundamentals of Stage Design (5).**  
The basic considerations involved in all aspects of the performer's stage environment.
305. **Design in the Theatre I (5).** Pr., 304 or equivalent.  
A continuation of fundamental design concepts with emphasis on stage lighting.
306. **Design in the Theatre II (5).** Pr., 304, 305, or equivalent.  
Practice in stage design.
307. **Children's Theatre (3).**  
Theatre for children involving an examination of play scripts, acting, and production techniques.
308. **Creative Dramatics (3).**  
The dramatic instincts of pre-school and early elementary school children in the light of contemporary theory and practice in this area.
309. **Costume and Make-Up (3).**  
The design and construction of elementary stage costumes and make-up.
- 310-11-12. **Dramatic Production (3-3-3).** Lec. 2, Lab. 6. Only students approved by the department head may register for these courses.  
Advanced acting.
313. **Theatre Appreciation I (3).** General Elective. Not open to Theatre Majors.  
A survey of the theatre and stagecraft from early times to the present day, emphasizing the social and artistic position of the stage in each civilization.
314. **Theatre Appreciation II (3).** General Elective. Not open to Theatre Majors.  
A survey of contemporary plays and productions.
401. **Play Analysis (3).**  
An examination of play scripts emphasizing interpretation from the viewpoint of directorial theory.
402. **World Theatre (3).**  
Theatre literature and practice as they have developed and presently exist in cultures outside of the Western hemisphere.
403. **Seminar and Theatre Research (3).**  
The past and present patterns of research in all areas of theatre and practice.
404. **Directing I (5).**  
Introductory basis theory and technique of directing theatre productions.
405. **Directing II (5).**  
A continuation of 404 involving practical exercises in directing.
406. **Directing III (5).**  
Provides the student with several directing problems which must be solved through the completion of a directing project. Prerequisites 405, 406 or equivalents.
407. **Acting II (5).** Pr., 204, 205, 206, or equivalent.  
Specialized areas of acting theory and technique with emphasis on acting theoreticians of the twentieth century.
408. **Problems in Aesthetic Design (5).** Pr., 304, 305, 306, or equivalent.  
An intensive study of stage design problem solving based on the works of design theoreticians of the twentieth century.
409. **Directing IV (5).** Pr., 404, 405, or equivalent.  
Directing theory based on the detailed analysis of the work and writings of selected twentieth century directors.
- 410-11-12. **Dramatic Production (3-3-3).** Lec. 2, Lab. 6. Pr., approval of department head.  
Seminar and workshop in Advanced Acting.

- 425-26. **Theatre Practice in the School (5-5).** Pr., senior or graduate standing. (Either part can be taken separately.) To be offered in the Summer quarter only.  
For the teacher who is called upon to select, plan, coach, and produce plays, classroom and assembly programs.
427. **Introduction to Theatre Management (5).**  
An introduction to the field of theatre management with emphasis on elementary procedures involving sales and advertising management.
428. **Personnel Management in Theatre (5).**  
Personnel management in theatre involving study of the union regulations of Actor's Equity of America, the Screen Actor's Guild and international unionized performing.
429. **Theatre Plant Management (5).**  
Theatre plant management involving a study of design in relation to security, insurance and urban development.

## Veterinary Medicine (VM)

### Anatomy and Histology

*Head Professor Holloway*  
*Assistant Professor James*  
*Instructors Reynolds, Guenther, and Milton*  
*Technician Dennis*

### Microbiology

*Head Professor Neal*  
*Professor Jennings*  
*Associate Professors Attleberger, Cody, and Miller*  
*Assistant Professors Wilt and McCain*  
*Instructor Smith*  
*Lecturers Alley and Christenberry*  
*Technicians Summers and Renfroe*  
*Grad. Res. Asst. Smith*

### Pathology and Parasitology

*Head Professor Groth*  
*Professor Roberts*  
*Associate Professors Hoff, Britt, Farnell\*\*, and Powers*  
*Assistant Professors Diamond, Teer\*\*, Shields, and Benz*  
*Research Lecturers Davis, Frandsen, and Ernst*  
*Technicians Davidson, McConnell, and Dale*

### Physiology and Pharmacology

*Head Professor Clark*  
*Professors Burns and Woodley*  
*Associate Professors Alexander and Beckett*  
*Assistant Professors Robertson, Botta, and Pedersoli*  
*Instructor Wright*  
*Technician Gilder*  
*Graduate Assistant Robie*

### Radiology Section

*Assistant Professor Bartels*

## Large Animal Surgery and Medicine

*Head Professor Schell*  
*Professors Gibbons, Wiggins, Walker\*\*, and Kiesel*  
*Associate Professors Winkler, Vaughan, Newman, Witherspoon\*\*, and Kjar*  
*Instructors Scott, Hudson, and Cooper*  
*Intern Brandon*

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\*\*On leave.

## Small Animal Surgery and Medicine

*Head Professor Hoerlein*

*Professor Redding*

*Associate Professor Horne*

*Assistant Professors Albert, Ramy, and Doering*

*Instructor Everett*

*Research Assistant Gage*

*Technicians Doerstling and Faulkner*

200. **General Microbiology (5).** Lec. 3, Lab. 4. Fall, Winter, Spring. Pr., General and Organic Chemistry.  
Fundamentals of microbiology including history of microbiology, morphology, metabolism, classification, identification, cultivation, and distribution of bacteria, viruses, yeasts, and molds; also an introduction to applied microbiology.
204. **Pathogenic Microbiology (5).** Lec. 3, Lab. 4. Summer, Fall, Spring. Pr., General Microbiology.  
Microorganisms pathogenic to man and animals. Immunity to, and laboratory diagnosis of, diseases caused by microorganisms.
210. **Human Physiology (5).** Lec. 3, Lab. 4. All quarters.  
Functions and manner of operation of the body and its parts, with special emphasis on digestion, circulation and reproduction. Laboratory exercises illustrate the functions of the various organ systems of the body.
220. **Human Anatomy and Physiology (5).** Lec. 3, Lab. 4. Summer, Fall and Winter.  
For students in Laboratory Technology and others who are qualified. Human skeletal, muscular and nervous systems. Human models, cats and frogs are used in laboratory to supplement lecture material.
221. **Human Anatomy and Physiology (5).** Lec. 3, Lab. 4. Winter and Spring.  
Anatomy and physiology related to the heart, circulation, blood, digestion, metabolism, kidney, respiration, endocrines and reproduction.
311. **General Bacteriology (5).** Lec. 3, Lab. 4. Winter and Summer.  
For students in Home Economics. Elementary bacteriology as applied to foods, industry and home sanitation.
318. **Physiology I (3).** Lec. 2, Lab. 2. Fall.  
Theoretical and practical application of radioactive nuclides in biologic systems and principles of electronic instruments used in veterinary medicine.
- 320-21-22. **Anatomy I, II, III (5-5-5).** Lec. 2, Lab. 10. Fall, Winter and Spring.  
Gross anatomy of domestic animals. A progressive anatomical study of the gross structures of the dog, ox, horse, hog and fowl.
326. **Histology (5).** Lec. 2, Lab. 6. Fall.  
Microscopic anatomy of the form, structure, and characteristics of basic animal tissues.
327. **Organology (5).** Lec. 2, Lab. 6. Winter. Pr., VM 326.  
Continuation of VM 326. Microscopic anatomy of the tissue composition of organs and organ systems.
328. **Embryology (5).** Lec. 2, Lab. 6. Spring. Pr., VM 327.  
Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
329. **Physiology II (3).** Lec. 2, Lab. 2. Winter.  
Metabolism, liver function, molecular physiology, and chemical digestion.
330. **Veterinary Microbiology I (5).** Lec. 3, Lab. 4. Fall.  
Fundamentals of microbiology for students in veterinary medicine.
331. **Veterinary Microbiology II (5).** Lec. 3, Lab. 4. Winter. Pr., VM 330 or equivalent.  
Sources and mechanisms of infections, principles of immunology, and biological prophylaxis and therapy. Also includes serological techniques used in diagnosis of infectious diseases.
332. **Physiology III (2).** Lec. 2, Lab. 2. Spring.  
Metabolism, liver function, molecular physiology, and chemical digestion.
336. **Physiology IV (5).** Lec. 4, Lab. 3. Spring.  
Endocrinology, reproduction, mechanical digestion, and respiration.
421. **Animal Physiology (5).** Winter.  
Physiology of the farm animals with special emphasis on digestion, endocrinology and reproduction.

422. **Animal Disease Control (5).** Spring. Pr., VM 421 and General Microbiology. Herd management and practices proven to be of value in the prevention and control of the important diseases of farm animals.
- 436-37-38. **Pharmacology I, II, III (5-3-5).** Lec. 3, Lab. 4. Fall, Winter and Spring. Pharmacodynamics, posology and therapeutics of drugs with veterinary application. Drugs are designated by U.S.P., generic, and proprietary names.
443. **Physiology V (5).** Lec. 4, Lab. 3. Fall. Neurology and electrocardiology.
444. **Physiology VI (5).** Lec. 4, Lab. 3. Winter. Blood, circulation, fluids and the kidney.
450. **Pathology I (5).** Lec. 3, Lab. 4. Fall. Pr., VM 326-327-328. General pathology. Fundamental anatomic and functional alterations of cells and tissues in disease.
451. **Pathology II (5).** Lec. 3, Lab. 4. Winter. Pr., VM 450. Study of disease processes affecting animals. Emphasis is placed on gross and microscopic changes in organs and systems.
452. **Clinical Pathology (3).** Lec. 1, Lab. 4. Spring. Pr., VM 451. Methods for the collection, preservation, and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
453. **Pathology III (3).** Lec. 2, Lab. 2. Spring. Pr., VM 451. Continuation of VM 451.
456. **Veterinary Parasitology I (3).** Lec. 2, Lab. 2. Fall. Introduction to parasitology including internal parasites of ruminants.
457. **Veterinary Parasitology II (5).** Lec. 3, Lab. 4. Winter. Pr., VM 456. Internal parasites of domestic animals.
458. **Veterinary Parasitology III (3).** Lec. 2, Lab. 2. Spring. Pr., VM 457. Important ectoparasites of domestic animals.
461. **Veterinary Microbiology III (5).** Lec. 3, Lab. 4. Spring. Pr., VM 331 or equivalent. Detailed study of bacteria, viruses, yeasts and molds causing diseases of domestic animals.
- 500-01-02. **Veterinary Medicine I, II, III (5-5-3).** Fall, Winter and Spring. Detailed study of the etiology, symptoms, pathogenesis, diagnosis, treatment and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.
503. **Veterinary Surgery I (3).** Lec. 3. Winter. Background of surgery; major surgical injuries-wounds, fluid loss and infection; preoperative and postoperative care; surgical technique; anesthesia; and extirpative, reconstructive and physiologic surgery.
504. **Veterinary Surgery II (5).** Lec. 5. Spring. Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.
508. **Clinics III (1).** Lab. 10. Spring. Conferences, laboratory exercises and clinical practice in diagnosis, control and therapy of diseases of large domestic animals.
509. **Clinics IV (1).** Lab. 10. Spring. Conferences, laboratory exercises and clinical practice in diagnosis, control and therapy of diseases of small domestic animals.
510. **Veterinary Medicine IV (5).** Fall. Consideration of the noninfectious and parasitic diseases of the respiratory, cardiovascular, gastro-intestinal, urogenital and integumentary systems in the small domestic animals.
512. **Veterinary Surgery III (5).** Lec. 3, Lab. 4. Spring. Lecture-specific basic surgical techniques. Laboratory-performance of basic surgical operations on anesthetized animals owned by the University.
519. **Veterinary Medicine V (3).** Spring. Pr., VM 510. Continuation of VM 510. Detailed consideration of differential diagnosis of diseases of small domestic animals.
523. **Veterinary Public Health I (5).** Lec. 4, Lab. 2. Winter. Pr., VM 461. Principles of epidemiology, selected diseases of animals transmissible to man and the relationship of the veterinarian to public health and animal disease control agencies.
- 525-31. **Jurisprudence and Ethics (1-1).** Fall and Winter. Laws relating to duties of the veterinarian to the public and to his clients, his liabilities, rights, collection of fees, etc. Ethics as applied to the veterinary profession.



526. **Clinics I (2). Lec. 1, Lab. 4. Fall.**  
Demonstration and practice of methods employed in physical diagnosis, handling, restraint and administration of therapeutic agents to large animals.
527. **Clinics II (2). Lec. 1, Lab. 4. Winter.**  
The demonstration and practice of methods employed in physical diagnosis, handling, restraint and administration of therapeutic agents to small animals.
530. **Veterinary Radiology (3). Lec. 3. Winter.**  
Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
534. **Laboratory Animal Medicine (3). Lec. 2, Lab. 2. Fall. Pr., VM 461.**  
Management, utilization, and diseases of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits and nonhuman primates.
540. **Veterinary Obstetrics I (2). Winter.**  
Infertility of the male and female. Artificial insemination.
542. **Applied Anatomy (3). Lab. 6. Summer. Pr., VM 522.**  
Anatomy related to diagnostic, obstetrical and surgical procedures.
550. **Veterinary Obstetrics II (2). Spring.**  
Pregnancy diagnosis and the causes and corrections of dystocia in large animals.
552. **Jurisprudence and Ethics (1). Fall.**  
Laws relating to duties of the veterinarian to the public and to his clients, his liabilities, rights, collection of fees, etc. Ethics as applied to the veterinary profession.
553. **Special Anatomy (1 to 5). Hours and credit to be arranged. Pr., VM 320.**  
Elective course in which any phase of anatomy of domestic animals to the anticipated field of specialization may be studied.
554. **Veterinary Medicine VI (5). Summer.**  
Study and identification of the poisonous plants of the Southeastern states as well as their characteristic symptoms, lesions and treatment. Selected specific diseases of farm animals are also discussed.
- 555-56. **Veterinary Medicine VII, VIII (5-5). Fall and Winter.**  
Principal infectious diseases of the large domestic animals. Epizootiology, etiology, symptoms, diagnosis and prevention of diseases, including immunization and sanitation.
559. **Veterinary Medicine IX (3). Lec. 3. Fall.**  
Consideration of the noninfectious diseases of the eye and central nervous system in the small domestic animals.
560. **Veterinary Obstetrics III (3). Lec. 3. Summer.**  
Clinical application of the physiology of reproduction. Teratology.
561. **Veterinary Medicine X (3). Lec. 3. Fall.**  
Methods of diagnosis, necropsy findings, and treatment of common chemical and venom poisoning of farm animals and pets.
- 563-64-65. **Clinics VI, VIII, X (2-2-2). Lab. 11. Summer, Fall and Winter.**  
Conferences, laboratory exercises and practice in diagnosis, control, and therapy of diseases of small domestic animals.
- 566-67-68. **Clinics V, VII, IX (3-3-3). Lab. 11. Summer, Fall and Winter.**  
Conferences, laboratory exercises and clinical practice in diagnosis, control, and therapy of diseases of large domestic animals.
569. **Veterinary Public Health II (5). Summer. Pr., VM 542, 458, and 461.**  
Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
- 572-73-74. **Veterinary Surgery IV, V, VI (1-1-1). Lab. 2. Summer, Fall and Winter.**  
Detailed consideration and performance of advanced small animal surgery.
582. **Seminar (3). Winter.**  
Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.
588. **Veterinary Medicine XI (5). Lec. 5. Winter.**  
Special emphasis on the newer aspects of diseases of metabolism and the nutritional diseases of farm animals. Includes diseases of swine and sheep.
592. **Preceptorship (0). Spring. Non-Credit required course.**  
Completion of satisfactory preceptorship during the spring quarter is required for graduation.

## GRADUATE COURSES

414. **Techniques in Bacteriology (5). Pr., VM 461 or equivalent and junior standing. Any quarter by arrangement.**  
Advanced techniques used in bacteriology, pertaining to isolation, cultivation and identification of microorganisms. (Course limited to five students.)

418. **General Pathology (5).** Lec. 3, Lab. 4. Fall. Pr., satisfactory courses in histology and physiology.  
Fundamental alterations of disease, adapted for especially qualified graduate students. (Not available for candidates for M.S. in Veterinary Medicine.)
425. **Intermediate Human Physiology (5).** Lec. 4, Lab. 2. Fall by arrangement. Pr., VM 210 or its equivalent and junior standing.  
For advanced students in home economics, education and others who are qualified. A detailed study of the physiology of the various organs of the body. (Not available for candidates for M.S. in Veterinary Medicine.)
441. **Physiological Function Tests and Laboratory Diagnosis (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor, acceptable courses in physiology, and junior standing.  
Chemical, photometric, and enzymatic procedures used in diagnosis of abnormal body functions. Included are function tests for the thyroid, liver, kidney, heart, pancreas, etc.
460. **Histological Techniques (2 to 5).** Hours and credit to be arranged. Pr., VM 326 or equivalent and junior standing.  
Techniques employed in the preparation of cytological and histological materials.
465. **Special Techniques in Histopathology (3).** Lab. 9. Pr., VM 453, VM 460. Any quarter by arrangement.  
Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.
467. **Gross Pathology (2).** Lab. 6. Pr., VM 453, junior standing and permission of instructor. Any quarter by arrangement.  
Regular participation in autopsy examinations under supervision of senior staff members. Designed to give the graduate student experience in autopsy procedures and in diagnostic interpretation of gross lesions. (Required of all majors and minors in Pathology.)
480. **Radiological Techniques (5).** Lec. 3, Lab. 4. Any quarter by arrangement.  
Radiographic techniques including assignments on basic radiation physics.
495. **Virology (5).** Lec. 2, Lab. 6. Pr., VM 200 and VM 204 or VM 461; junior standing. Spring.  
Basic concepts, methods of isolation, cultivation and purification of viruses and rickettsiae. (For students in biological sciences, biochemistry, pharmacy and veterinary medicine.)
- 601-02. **Advanced Pathogenic Microbiology (5-5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., acceptable courses in microbiology and immunology.  
Identification of pathogenic microorganisms and their relationship to animal diseases.
- 604-05. **Immunology (5-5).** Lec. 2, Lab. 6. Pr., VM 461 or equivalent. Spring quarter by arrangement.  
Immunizing agents, methods of establishing immunity, and techniques for demonstrating various types of immunity and antigen-antibody reactions. The work may be arranged to meet the particular interest of the student.
608. **Determinative Microbiology (5).** Lec. 2, Lab. 6. Fall Quarter by arrangement. Pr., VM 200 and VM 414.  
Microbial classification, identification, and concepts pertaining to international rules of nomenclature.
609. **Clinical Mycology (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in bacteriology.  
Methods and techniques used in isolating and propagating yeasts, molds and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
610. **Microbial Physiology (5).** Lec. 2, Lab. 6. Pr., CH 418 and VM 414 or equivalent. Spring.  
Biochemistry and genetics of structure and metabolism of microorganisms.
- 611-12. **Advanced Pathology (5-5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., VM 453 or equivalent.  
A comprehensive study of gross and microscopic lesions of animal diseases.
615. **Oncology (5).** Lec. 1, Lab. 8. Pr., VM 465. Any quarter by arrangement.  
The gross and microscopic pathology of the neoplasms of the domestic animals.
616. **Histochemistry (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., CH 419, VM 418, VM 460 or ZY 308 or equivalent.  
Evaluation and application of histochemical methods in the localization of cellular constituents.
617. **Veterinary Protozoology (5).** Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 458 or ZY 411 or equivalent.  
Detailed study of selected diseases of veterinary importance caused by protozoan parasites.
- 618-619. **Veterinary Helminthology (5-5).** Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 458 or ZY 411 or equivalent.  
Detailed study of selected diseases of veterinary importance caused by metazoan parasites.

620. Pathology of Parasitic Diseases (5). Lec. 2, Lab. 6. Any quarter by arrangement. Pr., VM 453 and 458 or equivalent.  
A detailed study of the pathology of parasitic diseases of veterinary importance.
- 621-22. Advanced Anatomy (5-5). Lec. 2, Lab. 9. Pr., permission of instructor. Any quarter by arrangement.  
A. Cardio-vascular Anatomy. B. Anatomy of the Uro-genital System. C. Neuroanatomy. D. The Anatomy of the Locomotor System, and E. The Anatomy of the Special Senses.
624. Experimental Neuroanatomy (5). Lec. 2, Lab. 9. Pr., VM 621-622 (C) Neuroanatomy. Any quarter by arrangement.  
Results of especially oriented experimental lesions of the central nervous system employing the Horsley-Clark stereotaxic instrument.
- 625-26. Advanced Histology of Domestic Animals (5-5). Lec. 2, Lab. 9. Any quarter by arrangement.  
Special phases of the microscopic structure of animal tissues and organs.
631. Advanced Pathological Physiology (5). Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.  
The physiological response of the body to disease. Diseases discussed will be those of the liver and kidney.
632. Advanced Pathological Physiology (5). Lec. 4, Lab. 3. Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.  
Physiological explanation of abnormalities of the reproductive and endocrine systems.
633. Advanced Pathological Physiology (5). Lec. 4, Lab. 3. Any quarter by arrangement. Pr., VM 421 or its equivalent.  
Abnormalities of the nervous system which lend themselves to a physiological explanation.
- 635-36. Advanced Veterinary Pharmacology (5-5). Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 436, VM 437, VM 438.  
Pharmacology of some of the more important drugs used in veterinary medicine. In the laboratory, students will have an opportunity to determine the pharmacology of the drugs on the horse, cow, pig and dog.
638. Physiology of Digestion (5). Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.  
Enzymatic and bacterial digestion as well as the motility of the gastro-intestinal tract in farm animals.
639. Small Animal Nutrition (5). Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in physiology.  
Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
643. Veterinary Radiation Biology (5). Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in chemistry and animal physiology.  
Instruments used for radiation detection, isotope techniques, and diagnostic tests used in animals, and the effects of radiation on animal tissues. Isotopes will be primarily gamma emitters.
645. Electrocardiology and Blood Vascular Physiology (5). Any quarter by arrangement. Pr., VM 421 or its equivalent.  
Physiology of the blood vascular system and the advanced techniques used in electrocardiology.
647. Canine Neurosurgery (5). Lec. 2, Lab. 6. Any quarter by arrangement. Pr., permission of the instructor.  
Applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.
- 651-52. Advanced Large Animal Surgery (5-5). Lec. 1, Lab. 8. Any quarter by arrangement.  
Research in surgery. Advanced techniques for surgical procedures in domestic animals.
- 654-55. Advanced Large Animal Medicine (5-5). Lec. 1, Lab. 8. Any quarter by arrangement.  
Special study of the causes, methods of diagnosis, treatment and methods of control and eradication of selected non-surgical diseases of domestic animals.
- 657-58. Breeding Diseases of Animals (5-5). Any quarter by arrangement.  
Graduate study of fertility in domesticated animals, but particularly, investigation into the etiology, pathogenesis, and treatment of sterility and impaired fertility. Diseases of pregnancy and parturition are also included.
660. Advanced Small Animal Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement.  
Techniques in general small animal surgery.

662. **Advanced Small Animal Orthopedic Surgery (5).** Lec. 1, Lab. 10. Any quarter by arrangement.  
New techniques in general orthopedic surgery.
663. **Advanced Small Animal Eye Surgery (5).** Lec. 1, Lab. 10. Any quarter by arrangement.  
New techniques in eye surgery.
- 664-65. **Advanced Small Animal Medicine (5-5).** Lec. 1, Lab. 10. Any quarter by arrangement.  
Causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.
666. **Advanced Canine Neurology (5).** Lec. 3, Lab. 6. Any quarter by arrangement.  
Etiology of diagnosis, treatment and control of neurological diseases of the dog.
667. **Normal Radiological Anatomy (5).** Lec. 4, Lab. 2. Any quarter by arrangement.  
Normal structure, size and position of the various organs as they appear on flat and contrast radiographs.
668. **Advanced Radiology (5).** Lec. 1, Lab. 8. Any quarter by arrangement.  
Advanced radiographic techniques including fluoroscopy, uses of contrast mediums, and the principles of image intensification and cineradiography.
669. **Radiological Interpretations (5).** Lec. 1, Lab. 8. Any quarter by arrangement.  
Advanced study of radiological interpretation of pathological lesions of domestic animals.
671. **Small Animal Cardiovascular Surgery (5).** Lec. 1, Lab. 10. Any quarter by arrangement.  
Application of accepted, as well as the recently developed techniques of cardiovascular surgery.
696. **Seminar (0-1).** Non-credit course required of all graduate students in Veterinary Medicine.  
Meets regularly at scheduled intervals each year during Summer Quarter.
698. **Research Problems (2 to 5).** (Credit to be arranged.)
699. **Research and Thesis.** (Credit to be arranged.)

## Vocational, Technical, and Practical Arts Education (VED)

*Head Professor Montgomery*

*Associate Professors R. A. Baker, Bottoms, and Pruett*

*Assistant Professors Anderson, R. J. Baker\*, Couch\*, Eaddy, Selman, and Sink*

*Instructors Burton\*, Farrar\*, Hill\*, Nadolsky\*, Parker\*, Scott\*, and White*

*Education Specialist Frank*

102. **Orientation (1).**  
Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
103. **Orientation (1).**  
Helps freshmen in planning their professional careers.
104. **Introduction to Laboratory Experiences (1).**  
Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.
246. **Instructional Drawing (3).** Lab. 6.  
Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.
330. **Careers in Rehabilitation Services (5).**  
History, legal basis, and fields of rehabilitation services. Exploration of specialty fields of mental retardation, mental illness, public offender, physically handicapped, speech therapy and hearing, visually handicapped, respiratory disease, alcoholic and aging.
346. **Vocational and Practical Arts Education (3).**  
Ways of studying occupational needs and developing and operating local program of vocational and practical arts education.
400. **Introduction to Power Mechanics (5).** Lec. 2, Lab. 6.  
Design and operational theories related to power machines. Internal combustion engines; power trains; hydraulic and cooling systems

\*Temporary.

401. **Practicum in Small Gasoline Engines (5). Lec. 2, Lab. 6.**  
Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.
402. **Automotive Construction and Repair (5). Lec. 2, Lab. 6.**  
Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.
404. **Practicum in General Metals (5). Lec. 2, Lab. 6.**  
Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties; power tools; heat treating; ornamental iron work, cold metal; sheet metal; machining metals; and arc and gas welding.
405. **The School Shop (3).**  
Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.
406. **Practicum in Building Construction and Maintenance (5). Lec. 2, Lab. 6.**  
Application of skills and abilities needed in teaching the erections of buildings and other related structures. Bills of materials; hand and machine woodworking; structural carpentry; plumbing; design and installation of residence wiring; heating and cooling concrete and masonry construction; painting and other related information. (a) Agricultural education majors and (b) Basic vocational education majors.
407. **Practicum in Electricity (5). Lec. 2, Lab. 6.**  
Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.
409. **Teaching Electronics in Industrial Arts (5). Lec. 2, Lab. 6. Pr., departmental approval.**  
Theories and practices used in school electronic laboratories; projects designed and constructed.
414. **Program in Area of Specialization (3). Lec. 2, Lab. 2. Pr., VED 410.**  
Program planning principles involved in designing program activities for specific areas of specialization. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, and (G) Technical Education.
415. **Teaching in Area of Specialization (3). Lec. 2, Lab. 2. Pr., VED 414.**  
Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, (G) Technical Education.
423. **Program in Basic Vocational Education (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**  
(A) Agriculture, (B) Building Construction, (C) Distributive Business, (D) Metals Technology and (E) Power Mechanics.

Undergraduate students with a major in industrial arts will pursue a minor selected from some other teaching area in the secondary school program or in one of the areas included in the twelve-grade program. (For appropriate course or courses in Teaching or Program, see SED, IED, and PE.)

425. **Professional Internship in Vocational, Technical and Practical Arts Education (15). Pr., Sr. standing, Admission to Teacher Education three quarters prior to Internship, minimum of two appropriate Teaching and Program Courses.**  
(For description, see Professional Internship in School of Education section.)  
A directed practicum to provide opportunities for students to develop needed competencies in areas of specialization through observation and practice with on-going programs in selected centers. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, and (G) Technical Education.
436. **Learning Resources in Area of Specialization (3). Pr., FED 320 or equivalent.**  
(A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, and (G) Technical Education.
438. **Coordination and Supervision of Vocational Education Programs (3). Lec. 2, Lab. 2. Pr., VED 414.**  
Develops and maintains appropriate relationship between the school and on-the-job program; records of coordination; student placement; improving employable skills and habits; recruitment and selection of work experience applicants; work experience rotation; public information and other similar activities.

462. **Directed Work Experience in Distributive Education (5).** Lab. 10. Pr., VED 414.  
In-service, supervised work experience. Individually designed for part-time and/or summer experience.
466. **Teaching Out-of-School Groups (3).** Pr., VED 414.  
Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-480. **Trade and Technical Experience (5-5-5-5-5).**

#### Advanced Undergraduate and Graduate

408. **Teaching Mechanical Technology (5).**  
Objectives and methods; equipment and management of vocational education shops; organization of projects; recent developments in specialized areas of mechanics; in-service teaching problems. Student plans for demonstration of methods for teaching mechanical skills.
410. **Occupational Information (3).** Lec. 2, Lab. 2. Pr., junior standing, FED 320 or equivalent.  
Occupational structure, job qualifications and requirements, sources of occupational information, current trends, industrial and occupational surveys. Preparation, evaluation, and dissemination of occupational information used by teachers in vocational and technical schools.
413. **Nature of Adult Education (5).** Pr., junior standing.  
The characteristics of adults as learners and the history, philosophy, and nature of adult education; applied to specific adult groups in developing and implementing adult educational programs in basic, occupational or continuing education.
430. **Evaluation and Training in Vocational Rehabilitation (4).** Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., departmental approval and junior standing.  
Purposes, principles and techniques of client evaluation and training; including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
431. **Research in Evaluation and Training in Vocational Rehabilitation (4).** Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., departmental approval and junior standing.  
Study of a problem using research techniques, to be selected in consultation with the supervising professor.
432. **The Instructional Program in Workshop and Rehabilitation Facilities (3).** Lec. 3 hours daily for 4 weeks, internship 6 weeks. Pr., departmental approval and junior standing.  
Includes program development, teaching, learning, resources, evaluation, project development and production, and supervision.
433. **Management of Vocational Rehabilitation Workshops and Facilities (3).** Lec. 3 hours daily for 4 weeks, internship 6 weeks. Pr., departmental approval and junior standing.  
The function of organization and administration including: federal, state, and local roles, financial support, community interaction, personnel management, and operation of facilities.
434. **Work Sample Development (5).** Pr., VED 330 and junior standing.  
Development of methods of selection, standardization, and establishing norms for work samples used in vocational evaluation units.
435. **Vocational Evaluation in Rehabilitation (5).** Pr., VED 330 and senior standing.  
Evaluation techniques used in appraisal of the abilities of handicapped people to guide occupational choice. Includes use of TOWER system, work samples, on-the-job training, personal adjustment evaluation.
437. **Vocational Training and Occupational Orientation of the Mentally Retarded (5).** Pr., junior standing.  
Principles for providing occupational orientation and work experience; techniques of curriculum planning, job classification and evaluation, selection, and placement; curricular activities related to work experience; community agencies and public relations.
474. **Organization of Instruction in Trade and Industrial Education (5).** Pr., junior standing.  
Trade and occupational analysis; principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures for individualizing instruction.
485. **Audio-Visual Materials (5).** Lec. 4, Lab. 2. Pr., junior standing.  
Examination and evaluation of films, filmstrips, slides, exhibits, charts, maps, globes, recordings, radio, educational television and programmed materials. Attention given to contributions of audio-visual materials to the elementary and secondary school curriculum, to sources of audio-visual materials, and to operation, care and housing of necessary equipment.
491. **Problems in Teaching the Disadvantaged Adult (3).** Pr., junior standing.  
The disadvantaged adult as a learner with special emphasis upon the sociological, psychological and physiological factors that influence learning and participation in learning activities. Materials, methods and teaching techniques especially appropriate for teaching the disadvantaged adult.



## Graduate

602. **Teacher Education in Vocational and Practical Arts (5).** Pr., departmental approval.  
Designed for supervisors of student teachers, teacher educators, and other graduate students. Major emphases deal with administration of vocational education programs, research, problems which supervising teachers encounter in the student teaching program.
603. **Problems in Agricultural Occupations (5).** Pr., departmental approval.  
Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development; developing instruction units and planning teaching activities for on-farm and off-farm occupations.
606. **Organization and Utilization of Community Resources (5).** Pr., departmental approval.  
Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.
607. **Seminar in Research in Agricultural Education (4).**  
Review and criticism of contributions of research in agricultural education; using research in solving current problems; needs for additional research; planning of a comprehensive study or completion of a small study.
608. **Administration of Vocational and Practical Arts Education (5).** Pr., departmental approval.  
Prepares professional personnel for leadership positions and to relate current social demands to vocationally oriented programs. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.
609. **Selection, Creation and Use of Audio-Visual Materials (5).** Lec. 3, Lab. 4. Pr., VED 485 or consent of instructor.  
Selection and use of various materials for specific educational purposes and the production of materials as learning experiences.
625. **Internship in Vocational, Technical and Practical Arts Education (5-10).**  
A directed practicum in agency centers or programs whereby the graduate student develops administrative and programming competencies by translating theory into practice, testing principles and evaluating on-going activities.
646. **Studies in Education (1-3).** Pr., one quarter of graduate study.  
A problem using research techniques, to be selected in consultation with the supervising professor. A problem should be selected which will contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)
650. **Seminar in Areas of Vocational, Technical and Practical Arts Education (1-3),** may be repeated for maximum of 3 hours.  
Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
651. **Research Studies in Vocational, Technical and Practical Arts Education (5).**  
Review, analysis and interpretation of available research with emphasis on designing new research directed toward meeting the changing educational needs of individuals pursuing educational goals not requiring a baccalaureate degree.
652. **Curriculum and Teaching in Vocational, Technical and Practical Arts Education (5).**  
Teaching practices and reappraisal of selecting experiences, methods, materials, and content for curriculum improvement in social adjustment, occupational adjustment and occupational training programs.
653. **Organization of Program in Vocational, Technical and Practical Arts Education (2-5).** Pr., departmental approval.  
Advanced Course. Program, organization and development of basic and supplementary materials for guiding educators and educational systems in the continuous improvement of curriculum and learning practices.
654. **Evaluation of Programs in Vocational, Technical and Practical Arts Education (5).**  
Evaluation and investigation of teaching effectiveness in social adjustment, occupational adjustment and occupational training with attention also given to the utilization of human and material resources and the coordination of the total school program with other educational programs in the community.
659. **Practicum in Areas of Specialization (1-10).** (May be repeated for a maximum of 10 hours.)  
The practicum provides graduate students with supervised experiences in various work settings with emphasis on the application of concepts, principles and skills acquired in previous course work.
699. **Thesis Research.** (Credit to be arranged.) (May be taken more than one quarter.)

**Zoology-Entomology (ZY)**

*Professors Arant, Blake, Dendy, Dusi, K. L. Hays, J. M. Lawrence, Ottis, Pearson, and Swingle*

*Associate Professors Allison, Bass, Berger, Cunningham, Hyche, Juey, Mount, Moss, Prather, and Shell*

*Assistant Professors Dixon, Dobie, Estes, Gilliland, Greene, D. Hays, Kouskolekas, F. Lawrence, Mason, Rogers, Smitherman, Watson, and Wilson*

*Instructors Bush, Jeffrey, Pardue, and Schmittou*

*Leader Cooperative Fishery Research Unit Ramsey*

*Leader Cooperative Wildlife Research Unit Speake*

*Research Lecturers Davis, Frandsen, and Porter\**

With few exceptions Principles of Biology, BI 101 and Animal Biology, BI 103 are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (Page 209).

**100. Zoological Orientation (0). Lec. 1. Fall.**

Historical and current concepts embodied in various disciplines of the zoological sciences.

**102. General Zoology (5). Lec. 4, Lab. 2. Pr., ZY 101. All quarters.**

Structure, habits, development, function, distribution, heredity, and economic importance of chordate animals.

**204. Insects (3). General elective.**

Life processes, occurrence, and importance of insects. (May not be taken for credit by students who have already earned credit in a more advanced course in entomology.)

**205. Wildlife Conservation (3). Fall. General elective.**

Conservation and natural history of important wildlife animals, especially Alabama fish, amphibians, reptiles, birds, mammals. Some field trips may be required, as substitute for part of the scheduled lectures. (May not be taken for credit by students who have already earned credit in more advanced wildlife courses.)

**206. Conservation in the United States (3). Winter, Spring, Summer. General elective.**

Basic facts essential to an understanding of current problems pertaining to the conservation of our rapidly depleting natural resources such as soil, water, minerals, forest, and wildlife. Especially planned for elementary and high school teachers.

**207. Birds (3). Lec. 3. Fall, Summer. General elective.**

Birds in relation to agriculture and game management, recognition of various species as to flight, color markings, songs, and feeding habits. (May not be taken for credit by students who have already earned credit in ZY 422.)

**210. Fish Culture (3). Lec. 3. Winter. General elective.**

Construction and management of ponds, and the principles underlying fish production; also fishing methods, bait production, and the identification of the more common sport fish. (May not be taken for credit by students who have already earned credit in a more advanced course in fisheries.)

**214. Vertebrate Physiology and Anatomy (5). Lec. 4, Lab. 3. Fall, Winter. Pr., BI 103.**

Function and structure of the organ systems of the vertebrate. Aimed primarily to fill the needs of students in the School of Education. Cannot be used as a prerequisite to ZY 424.

**300. Genetics (5). Lec. 4, Lab. 3. All quarters. Pr., BI 102 or 103 and MH 107 or equivalent.**

Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory work emphasizes experiments with the fly, *Drosophila*.

**301. Comparative Anatomy (5). Lec. 3, Lab. 6. All quarters. Pr., BI 103.**

Comparisons of the systems of the vertebrates.

**302. Vertebrate Embryology (5). Lec. 3, Lab. 6. Fall, Winter, Spring. Pr., BI 103.**

Consideration of the details of fertilization, cleavage, morphogenesis, and organogenesis of the amphioxus, frog, chick, pig, and human from a descriptive and analytical viewpoint. Laboratory work will consist of prepared material supplemented with available living material.

**303. Principles of Evolution and Systematics (5). Lec. 5. Winter. Pr., BI 102 or 103.**

The major processes, methods, and philosophic basis for presentday concepts of evolution and systematics.

**304. General Entomology (5). Lec. 4, Lab. 3. Fall, Spring, Summer. Pr., BI 103.**

General characteristics and habits of the orders and families of the Class Insects.

**305. Forest Entomology (3). Lec. 2, Lab. 3. Spring. Pr., BI 103.**

Principles of entomology in relation to insects of forests and forest products; recognition, life histories, and control of major insects of forests.

\*On leave.

306. **General Animal Ecology (5).** Lec. 4, Lab. 3. Fall, Spring. Pr., 10 hours of biology or permission of instructor.  
The physical and biotic environments and the interactions of these factors with animals. The organization and functions of communities and populations.
308. **Micrology (5).** Lec. 3, Lab. 6. Fall, Winter, Spring. Pr., BI 103.  
Basic processes and principles of micrology. Laboratory methods of fixation, embedding, sectioning, coloring, and mounting of tissues of vertebrate and invertebrate animals.
310. **Cell Biology (5).** Lec. 4, Lab. 3. All quarters. Pr., 10 hours of General Biology.  
Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
312. **Practical Fish Culture (5).** As arranged.  
Credit will be arranged for 3 months work in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture.
326. **Wildlife Biology (5).** Lec. 3, Lab. 6. Winter. Pr., a course in ecology.  
Basic principles of the ecology of wildlife populations and their relations to natural habitat. Laboratory work will consist of practical exercises designed to acquaint the student with modern methodology and technique in studying wild bird and mammal populations.
401. **Invertebrate Zoology (5).** Lec. 3, Lab. 6. Fall, Winter, Summer. Pr., BI 103 and junior standing.  
Biology, taxonomy, and ecology of invertebrate animals.
402. **Economic Entomology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer. Pr., junior standing.  
Consideration of the biological aspects, life histories, and control of insects.
404. **Medical Entomology (5).** Lec. 4, Lab. 3. Spring. Pr., ZY 304 and junior standing.  
Insects, mites, and ticks of parasitological or medical importance to man. Emphasis placed on the role of arthropods in transmission of protozoan and other diseases and prevention of these diseases by controlling their arthropod vectors.
405. **Forest Insects (5).** Lec. 4, Lab. 3. Fall. Pr., ZY 304, 305, or 402 and junior standing.  
Principal insects of forests and forest products; their importance, taxonomy, bionomics, and control. Emphasis will be placed on life histories and habits, identification by morphological characteristics and type of damage, and control by chemical, biological, and cultural or forest-management practices.
406. **Bee Culture (3).** Lec. 2, Lab. 3. Spring. Pr., BI 103 and junior standing.  
Manipulation and production of bees and honey, and a consideration of bee diseases.
407. **General Insect Morphology (5).** Lec. 3, Lab. 6. Spring. Pr., ZY 304 and junior standing.  
Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
409. **Histology (5).** Lec. 3, Lab. 6. Winter, Spring, Summer. Pr., BI 103 and junior standing.  
Morphology, histogenesis, regeneration and repair, and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
410. **Systematic Entomology (5).** Lec. 2, Lab. 6. Winter. Pr., ZY 304 and junior standing.  
Principles of systematics and identification of insects through orders, families, genera, and species.
411. **General Parasitology (5).** Lec. 3, Lab. 6. All quarters. Pr., BI 103 and junior standing.  
Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships. Techniques of examining animals for the presence of parasites and the proper preparation of such collections for study.
415. **Limnology (5).** Lec. 3, Lab. 6. Spring. Pr., CH 104, PS 205, BI 103 and junior standing.  
Biological, chemical, and physical factors affecting aquatic life.
416. **Biological Productivity and Water Quality (3).** Lec. 1, Lab. 6. Fall. Pr., CH 208 or consent of instructor and junior standing.  
Biological and chemical measures of water quality in streams and impoundments as related to fisheries. Effects of pollution, fertilization, and feeding of fish upon water quality.
- 418-19. **Experimental Heredity (3-3).** Lec. 1, Lab. 4. Fall, Winter. Pr., ZY 300 and junior standing.  
A two-quarter sequence in advanced experimental methods in genetics. Research problems utilizing various laboratory organisms will extend throughout the two quarters.

420. **Human Heredity (5).** Lec. 5. Spring. Pr., ZY 300, CH 208, and junior standing. Effects and normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations; problems in small sample analyses, biochemical screening of human "carriers," and the prospects for genetic engineering.
421. **Vertebrate Zoology I (5).** Lec. 3, Lab. 6. Fall, Spring, Summer. Pr., BI 103 and junior standing. Taxonomy, ecology, and evolution of fishes, amphibians, and reptiles.
422. **Vertebrate Zoology II (5).** Lec. 3, Lab. 6. Fall, Summer. Pr., BI 103 and junior standing. Basic taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.
424. **Animal Physiology (5).** Lec. 4, Lab. 3. Fall, Winter, Spring. Pr., ZY 301 and junior standing. Systematic study of the physiology of the nervous system, special senses, circulation, respiration, digestion, kidney function, hormonal control, and reproduction. An effort is made to acquaint the student with methods of experimentation as a means for the direct acquisition of physiological facts.
425. **Forest Wildlife Management (3).** Lec. 3. Spring. Pr., FY 420 or permission of instructor. Principles of wildlife management as applied to forest properties. Restricted to students in forestry.
426. **Principles of Game Management (5).** Lec. 4, Lab. 3. Fall. Pr., ZY 326 and junior standing. Fundamentals of game management theory, application, and administration.
427. **Wildlife Habitat Analysis (3).** Lec. 1, Lab. 6. Summer. Pr., ZY 426, BY 406, and junior standing. Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.
428. **Hatchery Management (5).** Lec. 3, Lab. 4. Spring. Pr., BI 103 and junior standing. Operation of hatcheries for production of cold- and warm-water game fish and bait minnows; care of brood fish; methods of stocking, fertilizing, supplementary feeding, and controlling weeds; transportation of fish; control of parasites; and related hatchery problems.
429. **Quantitative Genetics (5).** Lec. 4, Lab. 3. Pr., ZY 300, BY 401 or permission of instructor. The theory of Mendelian inheritance extended to properties of populations dependent on segregation of genes at many loci.
435. **Marine Biology (3).** Fall. Pr., acceptable chemistry background, BI 103 or equivalent, and junior standing. Introduction to the physical, chemical, and biological characteristics of the marine environment.
436. **Management of Small Impoundments (3).** Lec. 1, Lab. 6. Summer. Pr., BI 103 and junior standing. Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
437. **Fisheries Biology (3).** Pr., BI 103 and junior standing. An introduction to the study of vital statistics of fish populations.
438. **General Ichthyology (5).** Lec. 3, Lab. 6. Fall. Pr., BI 103 and junior standing. Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
439. **Aquatic Communities (5).** Lec. 2, Lab. 9. Summer. Pr., BI 102-3 and junior standing. Environmental relations of the biota of freshwater habitats.
440. **Physical Marine Geology (4½).** Lec. 2, Lab. 5. Summer only. Pr., physical and historical geology, mineralogy, and junior standing. General introduction to the physical processes on the shores of Mississippi Sound, emphasizing the erosional and depositional effects of waves and currents. Beaches and spits periodically surveyed to measure changes in shape, height, cross-section, lateral shift, and particle distribution and to observe growth and destruction of bars, cusps, spits and tide-pools. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
441. **Chemical Marine Geology (4½).** Lec. 2, Lab. 5. Summer only. Pr., physical and historical geology, mineralogy, CH 105 and CH 206, and junior standing. Supervised research in the chemistry of the waters of Mississippi Sound and geochemistry of the bottoms. Lateral, vertical and tidal changes in water composition. Analyses of core samples taken from different environments: bayous, mudflats, bars, oyster reefs, bays, tidal channels and sandy shelves. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

442. **Marine Invertebrate Zoology (9).** Lec. 5, Lab. 12. Summer only. Pr., 18 hours of biology including BI 103, and junior standing.  
A general study of the anatomy, life histories, distributions, and phylogenetic relationships of all marine phyla below the chordates. Laboratory and field work included. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
443. **Marine Vertebrate Zoology and Ichthyology (9).** Lec. 5, Lab. 12. Summer only. Pr., 18 hours of biology including BI 103 and junior standing.  
A general study of the marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
444. **Marine Fisheries Biology (6).** Lec. 3, Lab. 9. Summer only. Pr., 25 hours of zoology including ZY 421, and junior standing.  
Survey of the principles of the subject beginning with a study of fishery landing statistics of the United States followed by other areas of the earth. The classic theory will be examined and statistical applications will be made to various Gulf of Mexico fisheries. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
445. **Fish Parasites (3).** Lec. 1, Lab. 6. Winter. Pr., ZY 411 and junior standing.  
The external and internal parasites of fishes, their identification, and control; laboratory studies on life histories and epidemiology of parasite populations in ponds and impoundments.
446. **Fish Diseases (3).** Lec. 1, Lab. 6. Spring. Pr., VM 200 and junior standing.  
Bacterial and viral diseases of fishes, their isolation, culture identification, and control.
447. **Management of Streams and Large Impoundments (3).** Lec. 3. Fall. Pr., ZY 437, or permission of instructor, and junior standing.  
Fish populations of streams and large impoundments and a consideration of methods for managing those populations.
450. **Zoogeography of the Vertebrates (5).** Lec. 4, Lab. 3. Winter. Pr., ZY 421 or permission of instructor and junior standing.  
The principles of geographic distribution of vertebrate animals.
498. **Special Problems (1-3).** Pr., senior standing.  
A. Zoology; B. Entomology; C. Fisheries Management; D. Wildlife Management. A student can register for a total of not more than three hours credit.

## GRADUATE COURSES

601. **Insect Morphology (3).** Lec. 1, Lab. 6. Fall. Pr., ZY 407.  
Detailed studies of the internal structures of insects.
602. **Advanced Insect Taxonomy (5).** Lec. 1, Lab. 8. Summer, odd years. Pr., ZY 410.  
Principles of systematics including phylogeny with emphasis on a particular group of insects which the student may choose.
603. **Insect Physiology (5).** Lec. 3, Lab. 6. Spring, even years. Pr., ZY 424 and ZY 601.  
General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.
604. **Insect Toxicology (5).** Lec. 4, Lab. 3. Winter.  
Toxic action of insecticides; analysis, preparation and use of insecticides; spray residues in relation to health; research methods in insect toxicology.
605. **Ornithology (5).** Lec. 3, Lab. 6. Spring. Pr., ZY 422.  
Ecology and behavior of birds.
606. **Mammology (5).** Lec. 3, Lab. 6. Winter. Pr., ZY 422.  
Taxonomy, ecology, and behavior of mammals.
607. **Farm Game Management (5).** Lec. 3, Lab. 6. Fall. Pr., ZY 426.  
For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special emphasis on farm game species.
608. **Forest and Range Game Management (5).** Lec. 3, Lab. 6. Winter. Pr., ZY 426.  
For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special reference to forest and range game.
609. **Advanced Applied Entomology (5).** Lec. 4, Lab. 3. Spring. Pr., ZY 402.  
Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.
610. **Immature Forms of Insects (5).** Lec. 2, Lab. 6. Winter. Pr., ZY 410.  
Structure and identification of immature forms of insects; methods of collecting and preserving; development and use of keys for classifying immature insects.
611. **Advanced Insect Morphology and Embryology (3).** Lec. 1, Lab. 6. Winter. Pr., ZY 601.  
Insect morphology in relation to comparative embryological developments of insects.

612. **Advanced Insect Toxicology (5).** Lec. 4, Lab. 3. Spring, odd years. Pr., ZY 604. Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides; recent developments in the field of insecticide chemistry.
613. **Insect Pathology (5).** Lec. 3, Lab. 4. Fall. Pr., VM 200, ZY 402, and consent of instructor.  
The microorganisms associated with diseases in insects and their pathological effects on insects and insect populations.
614. **Physiology of the Cell (3).** Winter. Pr., ZY 424 and **Organic Chemistry.** Examination of the basic physiological processes at the cellular level with the tools and approaches of physical science.
615. **Advanced Fisheries Biology (5).** Lec. 4, Lab. 3. Summer. Pr., ZY 437.  
The concepts of population dynamics and of the interaction of reproduction, growth, and mortality in fish populations. Use of these concepts in fish population management.
616. **Ichthyology (3).** Lec. 3. Winter. Pr., ZY 438 or permission of instructor.  
Fishes of the world, emphasizing morphology, distribution, and life history. Review of world literature on fish systematics.
617. **Advanced Limnology (3).** Lec. 1, Lab. 6. Winter. Pr., ZY 415.  
Principles and methods employed in modern limnological research.
618. **Aquaculture (3).** Winter. Pr., ZY 416.  
Principles underlying aquatic productivity and levels of management as demonstrated by domestic and foreign lotic and lenitic cultures of fish and other aquatic crops.
619. **Comparative Invertebrate Physiology (5).** Lec. 4, Lab. 3. Spring. Pr., ZY 401 and permission of instructor.  
The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.
622. **History and Literature of Zoology (4).** Lec. 3, Lab. 3. Winter. Pr., graduate standing.  
A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.
623. **Organic Evolution (5).** Fall. Pr., ZY 430 or ZY 300.  
Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.
624. **Neurobiology (5).** Lec. 3, Lab. 6. Winter. Pr., ZY 424.  
Morphology, physiology, and evolution of the central, autonomic, and neurohormonal systems of the vertebrate.
627. **Immunology and Physiology of Parasites (5).** Lec. 3, Lab. 6. Winter, even years. Pr., ZY 411, VM 200, ZY 424, and consent of instructor.  
Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.
628. **Endocrinology (5).** Spring. Pr., ZY 424 and biochemistry.  
A comprehensive treatment of the classical and modern literature of endocrinology for the qualified student in animal biology.
629. **Advanced Quantitative Genetics (5).** Lec. 4, Lab. 2. Pr., ZY 429 or equivalent.  
Principles of quantitative genetics applied to breeding, emphasizing difficulties encountered in commercial breeding programs.
630. **Advanced Genetics (5).** Winter. Pr., ZY 300 and BY 401.  
Non-Mendelian hereditary systems; regulation of gene action as it influences growth, differentiation, and development; the use of statistics as an investigational tool; and the status of contemporary genetic research.
632. **Helminthology (5).** Lec. 3, Lab. 6. Spring. Pr., ZY 411.  
Advanced studies of the morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
634. **Protozoology (5).** Lec. 3, Lab. 6. Winter, odd years. Pr., ZY 411.  
Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories of parasitic forms will be emphasized.
635. **Furbearer and Waterfowl Management (5).** Lec. 3, Lab. 4. Winter. Pr., ZY 426.  
For graduate students with a major or minor in wildlife management. A study of furbearer and waterfowl resources. Emphasis is placed on problems of management and utilization.
636. **Ecology and Animal Populations (3).** Fall. Pr., ZY 306.  
An investigation of the balance of nature, population cycles, natural regulation of animal numbers, competition, epizootics, and the compensatory adjustments of populations to changes in the environment.



637. **Herpetology (5). Lec. 1, Lab. 8. Spring. Pr., ZY 421.**  
A study of the morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.
638. **Experimental Endocrinology (5). Spring. Pr., ZY 628 or taken concurrently.**  
Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
640. **Nematology (3). Lec. 2, Lab. 3. Spring. Pr., ZY 401 or 411.**  
Study and identification of the free-living soil- and aquatic nematodes and of the insect-parasitic nematodes. Detailed consideration of aspects of nematode morphology, reproduction, development, behavior, physiology, and ecology.
641. **Field Entomology (3). Lec-Dem. 4. Fall or Spring. Pr., graduate standing.**  
Identification of more important orders, families, and species of insects; a consideration of morphology, physiology, and development of insects; control of major pests. A collection of at least 100 species of economic insects will be required.
642. **Chemical Control of Insects (3). Lec-Dem. 4. Winter. Pr., graduate standing.**  
Properties of insecticides, including toxic action in living organisms; major uses and methods of application of formulations; hazards involved in handling insecticides; spray residues in relation to marketability of crops.
693. **Seminar. (Credit to be arranged.)**
697. **Problems in Marine Zoology (4-9). All year. Pr., ZY 442-3.**  
Supervised research on specific problems in marine zoology for graduates. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
698. **Special Problems (2-5). All quarters.**  
A. Zoology; B. Entomology; C. Apiculture; D. Parasitology; E. Physiology; F. Fisheries; G. Wildlife.
699. **Research and Thesis. (Credit to be arranged.)**
799. **Doctoral Research and Dissertation. (Credit to be arranged.)**

# Faculty And Staff

1968-69

(The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment to present rank. Effective date of resignation shown only for persons whose names were not carried in a previous catalog.)

## GENERAL ADMINISTRATIVE OFFICERS

- ANDREWS, WARREN M. *Director of Nuclear Science Center*, 1961, 1965  
B.S., Auburn University; M.S., Vanderbilt University; M.S., Ph.D., University of California.
- BEAR, ROBERT J. *Comptroller and Assistant Treasurer*, 1961  
B.S., Cornell University; M.B.A., George Washington University.
- BEARD, G. W. *Director of Athletics*, 1937, 1951  
B.S., Auburn University.
- BENTLEY, CHARLES S. *Assistant Dean of Student Affairs*, 1951, 1965  
B.S., M.S., Auburn University.
- BRADLEY, MARY HART *Assistant Dean of Women*, 1962, 1963  
B.S., M.A., University of Alabama.
- BROWN, MORGAN W. *Director of Student Health Service*, 1950  
B.S., University of Alabama; M.D., Tulane School of Medicine.
- CAIN, JOHN L. *Director of Engineering Extension*, 1962  
B.Ch.E., Georgia Institute of Technology.
- CANTRELL, CLYDE H. *Director of Libraries*, 1944, 1959  
A.B., A.B.L.S., M.A., University of North Carolina; Ph.D., University of Illinois.
- CATER, KATHARINE C. *Dean of Women and Social Director*, 1946  
A.B., Limestone College; M.A., Mercer University; M.S., Syracuse University; Litt.D., Limestone College.
- \*CLARK, J. INGRAHAM *Dean of School of Architecture and Fine Arts*, 1967  
B.Arch., University of Michigan; M.S., University of Southern California; Ph.D., New York University.
- COKER, SAMUEL T. *Dean of School of Pharmacy*, 1959  
B.S., Auburn University; M.S., Ph.D., Purdue University.
- COLEMAN, MARY E. *Assistant Director for Women's Work, Cooperative Extension Service*, 1936, 1965  
B.S., Auburn University; M.A., Columbia University.
- COMPTON, NORMA H. *Dean of School of Home Economics*, 1968  
A.B., George Washington University; M.S., Ph.D., University of Maryland.
- CORLEY, TOM E. *Assistant Director, Agricultural Experiment Stations, Outlying Units*, 1946, 1966  
B.S., M.S., Auburn University.
- COX, J. GRADY *Dean of School of Engineering*, 1949, 1968  
B.S., M.S., Auburn University; Ph.D., Purdue University.
- DODGE, ENCEL H. *Director of Contract and Grant Development*, 1968  
B.S., Purdue University; M.S., Washington University.
- DUNLAP, JOHN F. *Director of Student Financial Aid*, 1959, 1962  
B.S., Clemson University.
- EDEN, THOMAS M., JR. *Conference Director*, 1955, 1968  
B.S., Auburn University.
- FARLEY, W. SCOTT *Director of Placement*, 1947, 1964  
B.S., Auburn University.
- FISHER, HOMER S., JR. *Associate Registrar*, 1963, 1967  
B.S., M.B.A., Auburn University.

\*Resignation effective July 1, 1960.

- FOY, JAMES E. *Dean of Student Affairs, 1950, 1960*  
A.B., M.A., University of Alabama.
- FUNCHESS, LINWOOD E. *Director of Buildings and Grounds, 1957*  
B.S., Auburn University; M.S., Cornell University.
- FUNDERBURK, H. HANLY, JR. *Vice President—Montgomery, 1961, 1968*  
B.S., M.S., Auburn University; Ph.D., Louisiana State University.
- GARNER, JAMES M., JR. *Radiological Safety Officer, 1966*  
B.S., Daniel Baker College.
- GREENE, JAMES E. *Dean of School of Veterinary Medicine, 1937, 1958*  
D.V.M., M.S., Auburn University.
- GUERIN, WILLIAM H. *Campus Planner and Architect, 1967*  
B.Arch., University of Florida.
- HAWKINS, HERBERT N. *Director of Admissions, 1962, 1966*  
B.S., M.S., Auburn University.
- HILL, W. B. *Assistant to the Director, 1935, 1965*  
B.S., Tuskegee Institute; M.S., Cornell University; Ph.D., University of Wisconsin.
- HOBBS, EDWARD H. *Dean of School of Arts and Sciences, 1967*  
A.B., University of North Carolina; M.A., University of Alabama; Ph.D., Harvard University.
- HORNE, DONALD L. *Director of Student Counseling Service, 1967*  
B.S., M.S., Ed.D., Auburn University.
- INGRAM, W. TRAVIS *Business Manager and Treasurer, 1925, 1953*
- JONES, RALPH R. *Associate Director of Cooperative Extension Service, 1936, 1962*  
B.S., Auburn University; M.S., Michigan State University.
- JONSON, WILLIAM C., JR. *Assistant Director of Engineering Experiment Station, 1956, 1967*  
B.S., U.S. Naval Academy.
- KILLIAN, ALBERT F. *Registrar, 1964, 1966*  
B.S., M.S., Auburn University.
- LAMAR, ANDREW W., JR. *Commandant and Professor of Military Science, 1968*  
B.S., U.S. Military Academy.
- LEISCHUCK, GERALD S. *Director of Institutional Research, 1963, 1966*  
A.B., M.A., Colorado State College; Ed.D., Auburn University.
- LITTLETON, TAYLOR D. *Dean of Undergraduate Studies, 1957, 1968*  
B.S., M.A., Ph.D., Florida State University.
- PARKER, W. VANN *Dean of The Graduate School, 1950, 1953*  
A.B., M.A., University of North Carolina; Ph.D., Brown University.
- PIERCE, TRUMAN M. *Dean of School of Education, 1955*  
Ph.B., Piedmont College; M.A., University of Alabama; Ph.D., Columbia University.
- ROUSE, ROY D. *Associate Director, Agricultural Experiment Station, 1949, 1966*  
B.S., M.S., University of Georgia; Ph.D., Purdue University.
- SARVER, JOSEPH B. *Executive Secretary of Alumni Association, Director of Auburn Development Program, 1951, 1960*  
B.S., Auburn University.
- SAUNDERS, ROBERT L. *Assistant Dean of Education, 1957, 1965*  
B.S., M.S., Ed.D., Auburn University.
- SIMMONS, CHARLES F. *Associate Dean of School of Agriculture, 1946, 1955*  
B.S., M.S., Auburn University; Ph.D., Ohio State University.
- SMITH, E. V. *Dean of School of Agriculture and Director of Agricultural Experiment Station, 1929, 1951*  
B.S., Auburn University; M.S., Ph.D., Iowa State University.
- STIMPSON, RITCHIE P. *Professor of Aerospace Studies, Air Force ROTC, 1967*  
B.S., Furman University; Colonel, U.S. Air Force.
- STRONG, ROBERT B. *Director of High School and Junior College Relations, 1962, 1967*  
B.S., M.S., Auburn University.
- SWEENEY, JAMES B., JR. *Professor of Naval Science, 1966*  
B.S., Amherst College; LL.B., University of Maryland; Captain, U.S. Navy.

- TAYLOR, W. H. \_\_\_\_\_ *Assistant Director of Cooperative Extension Service, 1946, 1965*  
B.S., Auburn University; M.S., Ed.D., Cornell University.
- TINCHER, WILBUR A., JR. \_\_\_\_\_ *Director of Educational Services, 1958, 1966*  
A.B., M.A., Ed.D., University of Kentucky.
- TURNER, OTHEL D. \_\_\_\_\_ *Dean of School of Business, 1968*  
B.A., University of Tulsa; LL.B., University of Arkansas; M.B.A., Ph.D., University of Texas.
- VANDEGRIFT, FRANK \_\_\_\_\_ *Director of Cooperative Education, 1964, 1966*  
B.M.E., Georgia Institute of Technology; M.A., Columbia Theological Seminary.
- WARREN, HOYT M. \_\_\_\_\_ *Assistant Director of Cooperative Extension Service, 1945, 1965*  
B.S., Auburn University; M.S., Ed.D., Cornell University.
- WARMAN, JAMES C. \_\_\_\_\_ *Director of Water Resources Research Institute, 1965*  
A.B., M.S., West Virginia University.
- WEGENER, EDWARD P. \_\_\_\_\_ *Director of Educational Television, 1954*  
B.S., University of Minnesota.
- WHITE, J. HERBERT \_\_\_\_\_ *Director of University Relations, 1965*  
B.S., Auburn University.
- WILLIAMS, LELAND H. \_\_\_\_\_ *Director of Computer Center, 1966*  
B.S., University of South Carolina; M.S., University of Georgia; Ph.D., Duke University.

## FACULTY

- PHILPOTT, HARRY M. \_\_\_\_\_ *President, 1965*  
A.B., Washington and Lee University; Ph.D., Yale University; D.D. (Hon.), Stetson University; LL.D. (Hon.), Washington and Lee University.
- BAILEY, WILFORD S. \_\_\_\_\_ *Vice President for Academic and Administrative Affairs, 1942, 1966*  
D.V.M., M.S., Auburn University; Sc.D., Johns Hopkins University.
- FUNDERBURK, H. H., JR. \_\_\_\_\_ *Vice President for Montgomery Affairs, Auburn University at Montgomery, 1961, 1968*  
B.S., M.S., Auburn University; Ph.D., Louisiana State University.
- LANHAM, BEN T., JR. \_\_\_\_\_ *Vice President for Research, 1939, 1966*  
B.S., Clemson University; M.S., University of Tennessee; Ph.D., Michigan State University.
- ROBERTSON, FRED R. \_\_\_\_\_ *Vice President for Extension, 1959, 1966*  
B.S., M.S., University of Tennessee; Dr.P.A., Harvard University.
- VALLERY, H. F. \_\_\_\_\_ *Assistant to the President, 1950, 1960*  
B.A., M.A., Louisiana State University; M.A., Ed.D., Columbia University.
- ABNEY, LOUIS O. \_\_\_\_\_ *Professor of Art, 1950, 1967*  
B.S.Art, M.A.Art, Auburn University.
- ACHEE, NICHOLAS, JR. \_\_\_\_\_ *Head, Science-Technological Division and Assistant Professor (Library), 1968*  
B.A., M.A., M.S.L.S., Louisiana State University.
- ADAMS, CLEVELAND L. \_\_\_\_\_ *Head Professor of Textile Engineering, 1952*  
B.T.E., Auburn University.
- ADAMS, FRED \_\_\_\_\_ *Professor of Agronomy and Soils, 1955, 1965*  
B.S., M.S., Louisiana State University; Ph.D., University of California.
- AKINS, WILLIAM HOWARD, JR. \_\_\_\_\_ *Instructor of English, 1967*  
B.A., M.A., Duke University.
- ALBERT, R. A., JR. \_\_\_\_\_ *Assistant Professor, Small Animal Surgery and Medicine, 1962, 1966*  
D.V.M., M.S., Auburn University.
- ALEXANDER, HERMAN D. \_\_\_\_\_ *Associate Professor of Physiology, and Pharmacology, 1950, 1966*  
B.S., M.S., Ph.D., Auburn University.
- ALEXANDER, MILTON J. \_\_\_\_\_ *Associate Professor in School of Business, 1968*  
B.S., University of Illinois; M.B.A., St. Louis University; D.B.A., Georgia State College.

- ALFORD, WILLIAM L. *Professor of Physics and Nuclear Science, 1952, 1964*  
A.B., Vanderbilt University; M.S., Ph.D., California Institute of Technology.
- ALLEN, JAMES W., JR. *Instructor of English, 1967*  
B.A., M.A., University of Florida.
- ALLEN, WARD SYKES *Associate Professor of English, 1964*  
B.A., M.A., Ph.D., Vanderbilt University.
- ALLEN, WILLIAM H., JR. *Associate Professor in School of Business, 1966*  
A.B., Centre College; LL.B., M.A., University of Alabama; B.D., Union Theological Seminary.
- ALLEY, ALVIN D. *Assistant Professor of Secondary Education, 1966*  
B.A., M.A., Ph.D., Florida State University.
- ALLEY, J. LEE *Lecturer in Microbiology, 1967*  
D.V.M., Auburn University.
- AMACHER, RICHARD E. *Professor of English, 1957, 1965*  
A.B., Ohio University; Ph.D., University of Pittsburgh.
- AMLING, HARRY J. *Professor of Horticulture, 1958, 1968*  
B.S., Rutgers University; M.S., University of Delaware; Ph.D., Michigan State University.
- ANDELSON, ROBERT V. *Assistant Professor of Philosophy, 1965*  
A.A., Los Angeles City College; A.B., University of Chicago; A.M., Ph.D., University of Southern California.
- ANDERSON, GEORGE B. *Assistant Professor, Army ROTC, 1967*  
B.S., Clemson University; Lt. Colonel U.S. Army.
- ANDERSON, JOEL I. *Assistant Professor of Vocational, Technical,  
and Practical Arts Education, 1967*  
B.S.E., M.R.C., University of Florida.
- ANDRESS, LARRY J. *Instructor in School of Business, 1965*  
B.S., Troy State University; M.B.A., University of Southern Mississippi.
- ANSON, CHARLES P. *Professor in School of Business, 1946*  
A.B., University of Wisconsin; M.A., Ohio State University; Ph.D., University of North Carolina.
- ANTHONY, W. B. *Professor of Animal Science, 1953, 1955*  
B.S., University of Illinois; M.S., Texas A&M University; Ph.D., Cornell University.
- APPLEBEE, FRANK W. *Head Professor of Art, 1926, 1932*  
Diploma, Massachusetts College of Art; B.S., M.App.Art, Auburn University.
- ARANT, FRANK S. *Head of Department, Zoology-Entomology, 1926, 1949*  
B.S., M.S., Auburn University; Ph.D., Iowa State University.
- ARNOLD, SALLY ANN *Instructor of Sociology, 1967*  
B.A., Penn. State University; M.A., Michigan State University.
- ASHBAUGH, ALEX C. *Assistant Professor of Elementary Education, 1966*  
B.A., M.A., Furman University; Ed.D., University of Georgia.
- ASKEW, RAYMOND F. *Associate Professor of Physics, 1960, 1965*  
B.S., Birmingham-Southern College; M.S., Ph.D., University of Virginia.
- ASKEW, WILLIAM C. *Assistant Professor in Chemical Engineering, 1967*  
B.S., M.S., Auburn University; Ph.D., University of Florida.
- ASKINS, DONALD H. *Instructor in English, 1965*  
B.S., Auburn University; M.A., University of Virginia.
- ASHMORE, BETTIE JANE *Coordinator of Counseling, Student Counseling  
Service, 1967*  
B.A., Florence State University; M.A., University of Alabama.
- ATKINS, ALWYN J. *Head Professor of Secondary Education, 1956, 1964*  
B.S., University of Chattanooga; M.S., Ph.D., University of North Carolina.
- ATKINS, GEORGE A. *Assistant Football Coach, 1956*  
B.S., Auburn University.
- \*ATKINS, LEAH R. *Instructor in History and Political Science, 1958, 1962*  
B.S., M.A., Auburn University.
- ATTLEBERGER, MARIE H. *Associate Professor of Microbiology, 1947, 1959*  
D.V.M., M.S., Auburn University.
- AUTREY, K. M. *Head of Department, Dairy Science, 1947*  
B.S., Louisiana State University; M.S., Ph.D., Iowa State University.

- BAGGETT, WILLIAM C., JR. *Instructor of Art*, 1968  
B.F.A., Auburn University.
- BAGWELL, JAMES E. *Assistant Professor of Geography*, 1950, 1956  
B.S., M.S., University of North Carolina.
- BAIRD, THOMAS R. *Instructor in School of Business*, 1968  
B.A., Lycoming College; M.B.A., East Tennessee State University.
- \*BAKER, EDWARD DALE *Assistant Professor of Architecture*, 1966  
B.S., Michigan State University.
- BAKER, J. MARSHALL *Professor of Chemistry*, 1957, 1965  
B.S., Missouri Valley College; M.S., Ohio State University; Ph.D., University of Missouri.
- BAKER, RICHARD ALBERT *Assistant Professor and Director, ORCU, Vocational, Technical and Practical Arts Education*, 1964  
B.S., M.S., Auburn University; Ed.D., Oklahoma State University.
- \*BALL, EUGENE S. *Instructor in Mathematics*, 1966  
B.S., M.S., Louisiana Polytechnic Institute.
- BALL, RICHARD WILLIAM *Professor of Mathematics*, 1954, 1960  
B.A., M.A., Ph.D., University of Illinois.
- BARBARY, ARTHUR E. *Instructor in School of Business*, 1965  
B.S., M.B.A., Auburn University.
- BARBIN, ALLEN RAY *Professor of Mechanical Engineering (P.E.)*, 1961, 1967  
B.S.M.E., Lamar State College of Technology; M.S.M.E., Texas A&M University; Ph.D., Purdue University.
- BARKSDALE, JELKS *Associate Professor of Chemistry*, 1946, 1957  
B.S., M.S., University of Alabama; Ph.D., Columbia University.
- BARKSDALE, ROBBIE ANDREWS *Serials Cataloger and Assistant Professor*, 1949, 1965  
A.B., Alabama College; B.S., M.S., Columbia University.
- BARRINGTON, WILLIAM NORMAN *Instructor in Health, Physical Education and Recreation*, 1963  
B.S., Auburn University; M.S., Peabody College.
- BARTELS, JAN E. *Assistant Professor of Veterinary Medicine*, 1967  
B.S., Oregon State University; D.V.M., Washington State University; M.S., University of Guelph.
- BARTON, ANN HUSSEY *Associate Professor of Home Economics*, 1963  
B.S., M.S., Auburn University; Ph.D., Florida State University.
- BASKERVILL, MARGARET M. *Associate Professor in Math*, 1943, 1965  
A.B., Randolph-Macon Women's College; M.A., University of Michigan; Ph.D., Auburn University.
- BASS, MAX H. *Associate Professor of Zoology-Entomology*, 1957, 1967  
B.S., Troy State University; M.S., Ph.D., Auburn University.
- BATAC, ANNE-MARIE *Instructor in Foreign Languages*, 1968  
B.A., Wake Forest College; M.A., Southern Illinois University.
- BAXTER, VIRGINIA L. *Instructor in Secondary Education*, 1968  
B.A., Western Reserve University.
- BEALL, GEORGE S. *Assistant Professor of Aerospace Studies, Air Force ROTC*, 1966  
B.S., University of Georgia; Major, U.S.A.F.
- BEALS, HAROLD O. *Assistant Professor of Forestry (R.F.)*, 1960  
B.S.F., M.S., Ph.D., Purdue University.
- \*BEAN, PHILLIP W. *Instructor of Mathematics*, 1967  
B.S., M.S., Auburn University.
- BEARD, ATHA *Instructor in School of Business*, 1965  
B.S., M.B.A., Auburn University.
- BEAUCHAMP, BESS *Catalog Librarian and Instructor*, 1960  
A.B., Hendrix College; M.A., Claremont Graduate School; M.A.L.S., Peabody College.
- BECKER, ROBERT C. *Instructor in School of Business*, 1968  
B.B.A., University of Minnesota; M.B.A., Auburn University.
- BECKETT, SIDNEY DWAYNE *Associate Professor of Physiology and Pharmacology*, 1966  
B.S., Mississippi State University; D.V.M., M.S., Auburn University; Ph.D., University of Missouri.

\*Temporary.



- BEKUS, ALBERT J. *Instructor of English*, 1968  
A.B., Florence State University; M.A., Auburn University.
- BELL, SIDNEY C. *Associate Professor of Agricultural Economics & Rural Sociology*, 1956, 1965  
B.S., M.S., Auburn University; Ph.D., Michigan State University.
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B.J., University of Missouri; M.P.A., The George Washington University.
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B.E.P., M.S., Ph.D., Auburn University.
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B.A., M.A., University of Mississippi; Ph.D., University of Illinois.
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B.A., Toronto University.
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B.S., M.S., Ph.D., University of Utah.
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B.A., M.S., Louisiana State University.
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B.S., M.S., Ph.D., Louisiana State University.
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B. of Arch., Auburn University.
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B.S., University of Pennsylvania; M.S., Brooklyn Polytechnic Institute; Ph.D., Cornell University.
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B.S., M.S., Auburn University; Ph.D., Cornell University.
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B.S., Tulane University; M.S., Louisiana State University; Ph.D., Auburn University.
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B.S., Duke University; M.B.A., Ohio State University; Major, U.S. Air Force.
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D.V.M., M.S., Cornell University.
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A.B., Duke University; M.S.L.S., University of North Carolina.
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B.A., Wisconsin State University; M.A., University of Illinois.
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B.S., Pennsylvania State University; M.S., University of Hawaii; Ph.D., Cornell University.
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B.S., Arkansas Polytechnic College; M.S., University of Arkansas; Ph.D., Mississippi State University.
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B.S., Tennessee Technological University; M.S., University of Tennessee.
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B.S., M.S., Mississippi State University.
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B.S.M.E., M.S.M.E., Ph.D., University of Florida.
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B.S., M.S., Auburn University.
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B.S., University of Florida; M.S., George Washington University.
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B.S., M.Ed., Auburn University.
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B.S., M.S., Ph.D., Ohio State University.
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B.E.E., M.E.E., Auburn University; Ph.D., University of Stuttgart, Germany.
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B.S., M.S., Auburn University.
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B.T.C., Auburn University; M.S.T.C., Clemson University; Ph.D., Victoria University of Manchester, England.
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Counseling Service, Counselor Education*, 1965  
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B.S., M.S., Indiana State University; Ph.D., Ohio State University.
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B.S., M.E., Pennsylvania State University.
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B.S., Ouachita University; M.S., Pennsylvania State University.
- THAXTON, G. DONALD..... *Assistant Professor of Physics*, 1966  
B.S., University of Richmond; Ph.D., University of North Carolina.
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B.S., University of Cincinnati; Ph.D., University of Florida.
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B.S., Birmingham-Southern College; M.S., Tulane University; M.A., University of Michigan.
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B.S., Ohio State University; M.A., Colorado State University.
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B.S., M.S., Kansas State University; Ph.D., Michigan State University.
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B.A., Ph.D., University of Texas.
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A.B., M.A., Bob Jones University; M.S., Purdue University.
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A.A., Riverside City College; B.A., M.A., San Diego State College.
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B.S., M.S., Ph.D., Auburn University.
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- WILDER, VIRGINIA V. \_\_\_\_\_ *Assistant Professor of Elementary Education*, 1966  
B.S., M.Ed., University of Georgia.
- WILLARD, JULIA L. \_\_\_\_\_ *Instructor of Elementary Education*, 1968  
B.A., B.S., Jacksonville University; M.Ed., Auburn University.
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B.A., M.A., Baylor University; B.D., Southwestern Theological Seminary; Ph.D., University of Texas.
- WILLIAMS, BENJAMIN B. \_\_\_\_\_ *Assistant Professor, Auburn University at Montgomery*, 1968  
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B.S., M.S., Ph.D., University of Florida.
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B.Arch., Texas A&M University.
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- WILLIAMS, ERNEST \_\_\_\_\_ *Professor of Mathematics*, 1934, 1948  
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B.S., United States Military Academy; Major, U.S. Army.
- WILSON, JANE A. \_\_\_\_\_ *Assistant Professor in Zoology-Entomology*, 1968  
B.S., Limestone College; M.S., Ph.D., Clemson University.
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- WILTSE, ROBERT E. \_\_\_\_\_ *Assistant Professor, Auburn University at Montgomery*, 1968  
A.A., Marion Military Institute; B.A., University of Miami; M.D., Medical College of Alabama.
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B.S., M.S., Auburn University.
- WINGARD, ROBERT EUGENE \_\_\_\_\_ *Head Professor of Chemical Engineering*, 1932, 1963  
B.S., M.S., Auburn University.
- WINKLER, JOHN K. \_\_\_\_\_ *Associate Professor of Large Animal Surgery and Medicine*, 1962, 1963  
D.V.M., Colorado State University.
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B.A., M.A., Washington State University.
- WISE, MATHEW NORTON \_\_\_\_\_ *Assistant Professor of Physics*, 1967  
B.S., Pacific Lutheran University; Ph.D., Washington State University.

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B.S., M.Ed., University of Georgia; Ph.D., University of Alabama.
- WITHERSPOON, DON M. \_\_\_\_\_ *Associate Professor of Large Animal Surgery*  
and *Medicine, 1964*  
D.V.M., University of Georgia.
- WOLFE, WALTER NOAKES \_\_\_\_\_ *Instructor in Mathematics, 1966*  
B.S., Auburn University; M.S., DePaul University.
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B.A., University of Akron.
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- WOODALL, JAMES R. \_\_\_\_\_ *Professor of English, 1952, 1965*  
B.S., Murray State University; M.A., University of Kentucky; Ph.D., Vanderbilt University.
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B.S.B.A., M.B.A., Auburn University.
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D.V.M., M.S., Auburn University.
- WRIGHT, JAMES S. \_\_\_\_\_ *Instructor in Physiology, 1967*  
B.S., M.S., Clemson University.
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B.A., M.A., Ph.D., Tulane University.
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and *Rural Sociology, 1946, 1964*  
B.S., M.S., Auburn University; Ph.D., Purdue University.
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B.S., M.S., Ed.D., Auburn University.
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and *Recreation, 1944, 1959*  
B.S., M.S., Auburn University.
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B.S., Troy State University; M.A.C.T., Auburn University.
- YU, JAMES C. M. \_\_\_\_\_ *Assistant Professor in Mechanical Engineering, 1967*  
B.S., National Taiwan University; M.S., Virginia Polytechnic Institute; Ph.D., Auburn University.
- ZENOR, PHILLIP L. \_\_\_\_\_ *Assistant Professor of Mathematics, 1968*  
B.S., M.S., Ph.D., University of Houston.
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A.B., St. Bernard College; Lieutenant, U.S. Navy.
- ZIEGLER, PAUL F. \_\_\_\_\_ *Associate Professor of Chemistry, 1949, 1958*  
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B.S., M.S., Auburn University; M.S., University of Michigan; Ph.D., Columbia University.
- ALLISON, FRED \_\_\_\_\_ *Professor Emeritus of Physics, March, 1961*  
A.B., Emory and Henry College; M.A., Ph.D., University of Virginia; D.Sc., Auburn University; LL.D., Emory and Henry College.
- ALVORD, BEN FINLEY \_\_\_\_\_ *Professor Emeritus of Research Data Analysis, June, 1966*  
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- ATKINSON, T. P. \_\_\_\_\_ *Professor Emeritus of Foreign Languages, March, 1961*  
Ph.B., A.B., Lebanon University; M.A., University of Georgia.
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B.S., Arch., Washington State University; M.S., Arch., Columbia University.

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B.S., M.S.E.E., Auburn University.
- COPPEIDGE, WILLIAM HOUSTON \_\_\_\_\_ *Associate Professor Emeritus of Industrial Engineering, June, 1966*  
B.S., Oklahoma State University; M.S., Auburn University.
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B.S., North Carolina State University.
- EDWARDS, CHARLES WESLEY \_\_\_\_\_ *Registrar Emeritus, June, 1966*  
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D.V.M., Auburn University.
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- JONES, DAN T. \_\_\_\_\_ *Professor Emeritus of Industrial Laboratories, June, 1961*  
Diploma, Auburn University.
- KUDERNA, JEROME \_\_\_\_\_ *Professor Emeritus of Education, June, 1962*  
B.S., M.A., Michigan State University.
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A.B., Tulane University; A.M., Ph.D., Harvard University.
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B.S., E.E., Auburn University.
- REYNOLDS, ALFRED WADE \_\_\_\_\_ *Head Professor Emeritus of History and Political Science, June, 1964*  
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B.S., M.S., University of Kentucky.
- ROBINSON, A. JUDE \_\_\_\_\_ *Associate Professor Emeritus of Mathematics, June, 1967*  
B.S., Clemson University; M.A., Emory University.
- ROY, KENNETH B. \_\_\_\_\_ *Editor Emeritus of Department of Publications, July, 1968*  
B.J., University of Missouri.
- SAHAG, L. M. \_\_\_\_\_ *Professor Emeritus of Engineering Graphics, March, 1961*  
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- SEAL, JAMES LEWIS \_\_\_\_\_ *Professor Emeritus of Botany, June, 1963*  
B.S.Ag., Clemson University; M.S., Iowa State University; Ph.D., University of Minnesota.
- SPANN, RANSOM D. \_\_\_\_\_ *Professor Emeritus of Electrical Engineering, June, 1964*  
B.S.E.E., E.E., Auburn University.
- SPIDLE, MARION WALKER \_\_\_\_\_ *Dean Emeritus of the School of Home Economics, June, 1966*  
B.S., Alabama College; B.S., M.A., Columbia University.
- SPRAGUE, ALBERT T. \_\_\_\_\_ *Associate Professor Emeritus of Electrical Engineering, June, 1967*  
B.S., U.S. Naval Academy; M.S., Harvard University.



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B.S., Auburn University; M.S., Iowa State University; Ph.D., Michigan State University.
- WARD, BENJAMIN P. .... *Associate Professor Emeritus of Mechanical Engineering, July, 1968*  
B.S., U.S. Naval Academy; M.S.M.E., Columbia University.
- WARE, LAMAR MIMS. .... *Head Professor Emeritus of Horticulture, June, 1966*  
B.S., M.S., Auburn University.
- WATWOOD, VERNON BELL .... *Professor Emeritus of Civil Engineering, June, 1966*  
B.C.E., M.C.E., Auburn University.
- WHITE, RAYMOND H. .... *Professor Emeritus of Education, April, 1965*  
B.S., Southwest Missouri State College; A.B., Drury College; A.M., University of Chicago;  
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- BALL, JOHN COOPER, JR..... *Director of Nonacademic Personnel*, 1967  
B.S.M.E., Auburn University.
- BARKSDALE, DORA..... *Assistant Head Resident, Sasnett Hall*, 1968
- BARROW, WILLIAM OWENS..... *Senior Counselor, Student Counseling Service*, 1948, 1951  
A.B., Birmingham-Southern College; M.A., Peabody College.
- BARRUM, JAMES A..... *Coordinator of Testing and Research, Student Counseling Center*, 1968  
B.S., Lamar State College of Technology; M.Ed., Stephen F. Austin State College.
- BARTON, FREIDA C..... *Head Resident of Dana Gatchell Hall*, 1956, 1962
- BEAR, ROBERT J..... *Comptroller and Assistant Treasurer, Business Office*, 1961  
B.S., Cornell University; M.B.A., George Washington University.
- BEARD, LINDA M..... *Assistant Food Service Manager, Women's Dining Hall*, 1968  
B.S., University of Southern Mississippi.
- BEATY, MAUDE F..... *Head Resident, Dowell Hall*, 1965
- BECK, BURTON C..... *Coordinator of Counseling, Student Counseling*, 1968  
B.S., Troy State University; M.Ed., Auburn University.
- BECKWITH, WILLIAM H..... *Director of Sports Public Relations*, 1951, 1958  
B.S., Auburn University.
- BEKUS, ELIZABETH S..... *Library Assistant, Library*, 1968  
A.B., Florence State University.
- BENTLEY, CHARLES S..... *Acting Dean, Student Affairs*, 1951, 1968  
B.S., M.S., Auburn University.
- BICKEL, MARGARET E..... *Tabulating Equipment Supervisor, Business Office*, 1945, 1963
- BLACK, HENRY G., JR..... *Electronics Technician in Electrical Engineering*, 1960
- BLACKSHEAR, DAVID WENDELL..... *Programmer*, 1966  
B.S., Georgia State College; IBM Education Center.
- BLACKWELL, JENIPHER B..... *Staff Nurse, Drake Infirmary*, 1968  
B.S., University of Colorado School of Nursing.
- BLAKEY, JUANITA T..... *Assistant to Dean, Dean of Women*, 1969  
B.A., Mississippi State College for Women; M.A., University of Alabama.
- BONE, WILFRED O..... *Television Maintenance Supervisor, Educational Television*, 1967, 1968
- BOWMAN, JOSEPH R..... *Construction Engineer, Buildings and Grounds*, 1945
- BOYNE, JOHN J..... *Director of Air University Graduate Program, Auburn University at Montgomery*, 1968  
A.B., M.A., University of Alabama; Ph.D., University of North Carolina.
- BRACKIN, GLENN..... *Television Operation Manager, Educational Television*, 1960, 1968
- BRADBERRY, GEORGE L..... *Associate Secretary, Alumni Association*, 1951, 1966  
B.S., University of Georgia.
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B.S., M.A., University of Alabama.
- BRASHER, ROBERT C..... *Supply Sergeant, Army ROTC*, 1966  
S.Sgt., U.S. Army.
- BRINKLEY, GEORGE W..... *Administrative Assistant, School of Education*, 1967  
B.A., Auburn University.
- BURGESS, JOHN ROBERT..... *Purchasing Agent, Business Office*, 1966

- BURTS, AGNES..... *Head Resident of Hollifield Hall, 1964, 1967*
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B.A., M.A., Louisiana Polytechnic Institute.
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B.S., Mississippi State University; M.A., Ph.D., University of Mississippi.
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- COOK, CLARENCE E..... *Director of Auburn Union, 1960*  
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B.S., Auburn University.
- DAVRIDGE, EVELYN..... *Head Resident, Little Hall, 1967, 1968*
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B.S., Auburn University.

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- GEIGER, SIDNEY E. .... Assistant Bursar, Business Office, 1967  
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Grounds, 1959, 1968
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- HERREN, FANNIE .... Head Resident of Dunn Hall, 1965
- HOCKMAN, WARREN D. YNCS .... Instructor, Naval Science, 1965
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- HOOD, RICHARD L. .... Assistant Janitor Foreman, Buildings and Grounds, 1957
- HORNSBY, JESSIE DOWDLE .... Laboratory Mechanician, Mechanical Engineering, 1960
- HOSKINS, DENVER .... Instructor, Army ROTC, 1968  
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B.S., Auburn University.
- HUDSON, FRANK L. .... Building Services Supervisor, Auburn Union, 1959, 1963
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B.S., Auburn University.
- JACKSON, HARRIS C. .... Laboratory Mechanician, Physics, 1964
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- KELLEY, EARL H. *Personnel and NESEP Yeoman, 1967*  
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B.S., Virginia Polytechnic Institute.

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- MCCARTY, MARY L. — *Administrative Secretary and Secretary to  
Board of Trustees, President's Office, 1961, 1966*
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University Relations, 1962*
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## Agricultural Economics and Rural Sociology

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 B.S., Murray State University; M.S., University of Kentucky; Ph.D., University of Illinois.  
 BELL, S. C. *Associate Professor, 1956, 1965*  
 B.S., M.S., Auburn University; Ph.D., Michigan State University.  
 DUNKELBERGER, J. E. *Associate Professor, 1962*  
 A.B., Franklin and Marshall College; M.S., Pennsylvania State University; Ph.D., Mississippi State University.  
 MCCOY, EDWARD W. *Assistant Professor, 1967*  
 B.S., M.S., University of Nevada; Ph.D., University of Tennessee.  
 VAN LANDINGHAM, CALVIN L. *Assistant Professor, 1968*  
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 HURST, J. R. *Instructor, 1959, 1965*  
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## Animal Health Research

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## Animal Science

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B.S., M.S., Auburn University; Ph.D., Louisiana State University.
- CLARK, E. M. *Associate Professor, 1956, 1960*  
B.S., M.S., Ph.D., University of Minnesota.
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TRUELOVE, BRYAN	Associate Professor, 1967
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RODRIGUEZ, KABANA R.	Assistant Professor, 1965
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KELLEY, WALTER D.	Instructor, 1966
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## Dairy Science

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ROLLINS, G. H.	Associate Professor, 1948, 1953
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## Forestry

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## Horticulture

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## Poultry Science

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## Publications

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STEVENSON, R. E. *Associate Editor, 1955, 1960*  
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## Research Data Analysis

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## Zoology-Entomology

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RAMSEY, JOHN S. *Leader, Fishery Research Unit (Coop. USDI), 1967*  
B.S., Cornell University; Ph.D., Tulane University.

SPEAKE, DAN W. *Leader, Wildlife Research Unit (Coop. USDI), 1955, 1967*  
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SWINGLE, H. S. *Alumni Research Professor, 1929, 1968*  
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BASS, MAX H. *Associate Professor, 1957, 1967*  
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BERGER, ROBERT S.	Associate Professor, 1963
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HYCHE, LACY L.	Associate Professor, 1952, 1960
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IVEY, W. D.	Associate Professor, 1947, 1962
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MOSS, DONOVAN D.	Associate Professor, 1967
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PRATHER, E. E.	Associate Professor, 1941, 1950
B.S., Auburn University; M.S., University of Michigan.	
SHELL, E. WAYNE	Associate Professor, 1952, 1965
B.S., M.S., Auburn University; Ph.D., Cornell University.	
ESTES, PAUL M.	Assistant Professor, 1966
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CAUSEY, MILES K.	Assistant Professor, 1968
B.S., M.S., Ph.D., Louisiana State University.	
GILLILAND, FLOYD R.	Assistant Professor, 1967
B.S., Arkansas Polytechnic College; M.S., University of Arkansas; Ph.D., Mississippi State University.	
GREENE, GEORGE N.	Assistant Professor, 1963, 1964
B.A., Rice University; M.S., University of Michigan; Ph.D., Auburn University.	
HILL, EDWARD P., III	Assistant Leader, Wildlife Research Unit, 1967
B.S., Oregon State University; M.S., Auburn University.	
KOUSKOLEKAS, COSTAS A.	Assistant Professor, 1967
B.S., University of Thessaloniki; M.S., University of Missouri; Ph.D., University of Illinois.	
ROGERS, W. A.	Assistant Professor, 1964, 1967
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SMITHERMAN, RENFORD O.	Assistant Professor, 1967
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STICKNEY, HENRY N.	Instructor, 1967
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JEFFREY, NORRIS B.	Instructor, 1968
B.S., North Carolina State University.	
PARDUE, GARLAND B.	Instructor, 1968
B.S., M.S., North Carolina State University.	
SCHMITTON, H. R.	Instructor, 1968
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## SUBSTATIONS AND FIELDS

### Black Belt—Marion Junction, Dallas County

SMITH, L. A.	Superintendent, 1951, 1957
B.S., Auburn University.	
GRIMES, HAROLD W., JR.	Assistant Superintendent, 1955, 1957
B.S., M.S., Auburn University.	

### Chilton Area Horticulture—Clanton, Chilton County

CARLTON, C. C.	Superintendent, 1948
B.S., Auburn University.	
SHORT, KENNETH C.	Assistant Superintendent, 1960
B.S., Auburn University.	

### Gulf Coast—Fairhope, Baldwin County

YATES, HAROLD F.	Superintendent, 1931, 1959
B.S., Auburn University.	

BARRETT, J. E., JR. \_\_\_\_\_ Assistant Superintendent, 1948  
B.S., Auburn University.

### Lower Coastal Plain—Camden, Wilcox County

BROWN, V. L. \_\_\_\_\_ Superintendent, 1949  
B.S., Mississippi State University.

FOWLER, WILLIAM E. \_\_\_\_\_ Assistant Superintendent, 1965  
B.S., Berry College.

WATSON, W. J. \_\_\_\_\_ Assistant Superintendent, 1958  
B.S., Auburn University.

### North Alabama Horticulture—Cullman, Cullman County

HOLLINGSWORTH, M. H. \_\_\_\_\_ Superintendent, 1958, 1962  
B.S., Auburn University.

### Piedmont—Camp Hill, Tallapoosa County

MAYTON, E. L. \_\_\_\_\_ Superintendent, 1929, 1945  
B.S., Auburn University; M.S., University of Vermont.

BURGESS, HOYT E. \_\_\_\_\_ Assistant Superintendent, 1967  
B.S., Auburn University.

### Sand Mountain—Crossville, DeKalb County

GISSENDANNER, S. E. \_\_\_\_\_ Superintendent, 1941, 1946  
B.S., Auburn University.

LESTER, HOWARD C. \_\_\_\_\_ Assistant Superintendent, 1958  
B.S., Auburn University.

### Tennessee Valley—Belle Mina, Limestone County

BOSECK, J. K. \_\_\_\_\_ Superintendent, 1937, 1954  
B.S., Auburn University.

WEBSTER, W. B. \_\_\_\_\_ Assistant Superintendent, 1958, 1965  
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### Upper Coastal Plain—Winfield, Fayette & Marion Counties

MOORE, ROBERT A., JR. \_\_\_\_\_ Superintendent, 1959, 1969  
B.S., M. of Agri., Auburn University.

### Wiregrass—Headland, Henry County

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B.S., Auburn University.

IVEY, HENRY W. \_\_\_\_\_ Assistant Superintendent, 1960, 1966  
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STARLING, J. G. \_\_\_\_\_ Assistant Superintendent, 1948  
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### Ornamental Horticulture Field Station—Spring Hill, Mobile County

SELF, R. L. \_\_\_\_\_ Plant Pathologist, 1942, 1952  
B.S., M.S., Auburn University; Ph.D., University of Wisconsin.

DRISKELL, NATHAN A. \_\_\_\_\_ Assistant Superintendent, 1967  
B.S., Louisiana State University.

### Brewton & Monroeville Fields—Escambia & Monroe Counties

RICHARDSON, J. W. \_\_\_\_\_ Superintendent (Brewton), 1937, 1948  
B.S., Auburn University.

### Prattville & Tuskegee Fields—Autauga & Macon Counties

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## OTHER STAFF

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FORMBY, MILTON	Laboratory Stores Attendant, Forestry, 1967
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MCURTURY, BETTY	Administrative Aide (Coop. USDA), Agronomy and Soils, 1960, 1966
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SCALES, WILLIAM L.	Electronics Technician, Agricultural Engineering, 1967
SIDES, DEWEY	Technical Assistant, Agronomy and Soils, 1967
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- HARTZOG, DALLAS L. *Program Coordinator, Peanuts*, 1966, 1967  
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- \*HENDERSON, J. B. *Specialist in Cotton*, 1960, 1963  
B.S., M.S., Auburn University.
- HERD, DENNIS B. *Extension Animal Husbandman*, 1967  
B.S., Berea College; M.S., Ph.D., University of Kentucky.
- HIGH, THOMAS W. JR. *Extension Animal Husbandman*, 1966  
B.S., University of Florida; M.S., Ph.D., University of Tennessee.
- HUDDLESTON, NORMAN R. *Economist*, 1968  
B.S., Tennessee Technological University; M.S., University of Tennessee; Ph.D., Mississippi State University.
- \*JOHNSON, PAUL O. *Specialist, Rural Resource Development*, 1959, 1965  
B.S., M.Ed., Auburn University.
- JONES, BERTHA MAE *4-H Club Specialist*, 1945, 1965  
B.S., Alabama A&M College; M.Ed., Pennsylvania State University.
- JONES, ROBERT F. *District Farm Agent*, 1949, 1966  
B.S., Tuskegee Inst.; M.Ed., North Carolina State University.
- JONES, R. S., JR. *Dairyman*, 1941, 1959  
B.S., Auburn University.
- KENNAMER, E. F. *Specialist in Wildlife*, 1940, 1960  
B.S., M.S., Auburn University.
- LANIER, WORTH *Extension Veterinarian*, 1960  
B.S., Mississippi State University; D.V.M., Auburn University.
- LEDBETTER, ROY J. *Entomologist*, 1954, 1962  
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- LEE, VERRON WILSON *Specialist, Poultry Marketing*, 1965, 1967  
B.S., Auburn University; M.S., University of Arizona.
- LEEPER, RAYMOND O., III *Specialist in Entomology*, 1967  
B.S., M.S., Mississippi State University.
- LINK, JAMES GORDON *Agronomist*, 1959, 1963  
B.S., M.S., Auburn University.
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B.S., M.S., Auburn University.
- LOGUE, H. E. *State 4-H Club Leader*, 1942, 1948  
B.S., M.Ag.Ed., Auburn University.
- MCDANIEL, CLARENCE H. *District Farm Agent*, 1952, 1965  
B.S., M.S., Alabama A&M College.
- MCQUEEN, HOUSTON FRANK *Survey Entomologist*, 1963  
B.S., Auburn University.
- MADDOX, C. L. *Specialist in Farm Management, TVA*, 1954, 1960  
B.S., M.S., Auburn University.
- MARABLE, JOHNNIE A. *District Program Specialist*, 1955, 1966  
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- MARKS, HERMAN H. *District Program Specialist*, 1954, 1963  
B.S., M.Ag., Auburn University.
- MAYFIELD, M. CECIL *4-H Editor*, 1955, 1966  
B.S., M.Ag., Auburn University.
- OGBURN, CHARLES B. *Agricultural Engineer*, 1968  
B.S., M.S., Virginia Polytechnic Institute.

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- OVERBEY, DOROTHY..... *Specialist in Consumer Education, 1943, 1949*  
B.S., University of Tennessee.
- PARKER, CARL..... *Specialist in Horticultural Production, 1944, 1961*  
B.S., Auburn University.
- PARRISH, J. R..... *Dairyman, 1938, 1948*  
B.S., M.S., Auburn University.
- PARROTT, JOHN L..... *News Editor, 1959, 1961*  
B.S., M.Ed., Auburn University.
- PEAVY, ALICE..... *Economist, Home Furnishings, 1941, 1959*  
B.S., University of Alabama; M.A., Columbia University.
- PITTS, JAMES H..... *Specialist, Livestock Production, TVA, 1955, 1965*  
B.S., M.S., Mississippi State University.
- PRICKETT, FARISS..... *Specialist in Foods and Nutrition, 1955, 1958*  
B.S., M.S., Auburn University.
- PRIESTER, JEANNE..... *Specialist in Educational Methods, 1958, 1964*  
B.S., Alabama College; M.S., Auburn University.
- RIVERS, RUTH L..... *District Home Agent, 1937, 1965*  
B.S., Tuskegee Institute; M.A., Columbia University.
- ROBERTS, LARRY W..... *Resource Management Specialist, 1960, 1968*  
B.S., M.S., Auburn University.
- SEGREST, CHARLES H..... *Specialist, Rural Resource Development, 1956, 1962*  
B.S., M.Ag.Ed., Auburn University.
- \*SHIPP, TRAVIS..... *Specialist in Rural Resource Development (Ind. Mgmt.), 1967*  
B.I.M., M.B.A., Auburn University.
- SHUMACK, RONALD LEE..... *Specialist, Ornamental Horticulture, 1963, 1967*  
B.S., M.Ag.Ed., Auburn University.
- SMITH, JACK D..... *News Editor, 1962*  
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- SMITH, PERRY M..... *Specialist in Commercial Horticulture, 1966*  
B.S., Clemson University; M.S., North Carolina State University.
- SOWELL, WALTER F..... *Soils Specialist, 1948, 1960*  
B.S., M.S., Auburn University; Ph.D., Purdue University.
- SPEAKMAN, GENTA S..... *Specialist, Housing and Equipment, 1966*  
B.S., M.S., Auburn University.
- STOREY, CLEVELAND U..... *Specialist, Rural Resource Development, 1965*  
B.S., Auburn University; M.Ag., University of Florida.
- STRAIN, WILLIE LEE..... *News Editor, 1955, 1965*  
B.S., M.Ed., Tuskegee Institute.
- STRICKLAND, ELMER OSCAR..... *District Program Specialist, 1961, 1963*  
B.S., M.Ag.Ed., Auburn University.
- TERRELL, ROBERT N..... *Specialist in Food Science, 1966*  
B.S., Oklahoma State University; M.S., University of Tennessee; Ph.D., University of Wisconsin.
- THOMAS, CHARLES F..... *Specialist in Poultry, 1958, 1966*  
B.S., M.S., Auburn University.
- THOMPSON, KATHLEEN..... *Specialist in Clothing and Handicraft, 1944, 1952*  
B.S., University of Alabama; M.S., Pennsylvania State University.
- THORNHILL, H. B..... *Marketing Specialist in Ornamental Horticulture, 1941, 1961*  
B.S., Auburn University; M.S., Clemson University.
- TIDWELL, MACON B..... *Specialist, Rural Resource Development, 1957, 1961*  
B.S., M.Ag., Auburn University.
- WADE, LARKIN H..... *Extension Forester, 1965*  
B.S., M.S., Auburn University.
- WALKER, CLEO S..... *District Home Agent, 1958, 1965*  
B.S., M.S., Tuskegee Institute.
- WATSON, HAROLD..... *Specialist in Agricultural Engineering, 1966*  
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WILLIAMS, GERTHEN E.	<i>Visual Editor, 1960, 1967</i>
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B.A., Emory University.	
JETER, DALENE	<i>Administrative Assistant, 1928, 1966</i>
JETER, RENNIE	<i>Business Assistant, 1934, 1947</i>
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WARNE, LANGLEY TOLBERT	<i>Editorial Assistant, 1968</i>
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## COUNTY STAFFS

(List for each county as follows: County Address, county extension chairman, extension farm agent; associate county extension chairman, extension home agent; first appointment, present appointment. All degrees are from Auburn University unless otherwise indicated.)

AUTAUGA Prattville	R. H. Kirkpatrick, B.S., M.Ed.; 1944, 1965; Jerry A. Green, B.S., Tuskegee Institute, 1954, 1965; Max F. Scott, B.S., 1962-1965. Margaret Campbell, B.S., Alabama College; M.S., University of Tennessee, 1950, 1965; Louvenia A. Lee, B.S., Tuskegee Institute, 1955, 1965.
BALDWIN Bay Minette	F. C. Turner, B.S., 1938, 1965; W. H. Johnson, B.S., 1934, 1965; Donald Eugene Dunn, B.S., 1962, 1965; Edward J. Coats, B.S., Western Kentucky State University; M.S., 1966. Mary C. Silvey, B.S., 1955, 1965; Eugenia Small, B.S., 1937, 1965; Marvell Gwaltney, B.S., University of Alabama, 1959, 1965.
BARBOUR Clayton	J. W. Walton, B.S., 1946, 1965; Jerry L. Brown, B.S., 1967; William H. Lindsey, B.S., Tuskegee Institute, 1966. Marilyn Dees Bennett, B.S., 1964, 1965; Betty Lumpkin Caraway, B.S., 1967; Tommie W. Clark, B.S., Tuskegee Institute, 1940, 1965.
BIBB Centreville	J. C. Odom, B.S., 1935, 1965; T. W. Camp, B.S., 1951, 1965. Kirtis Martin, B.S., 1933, 1965.
BLOUNT Oneonta	D. S. Loyd, B.S., M.Ag., 1942, 1965; James O. Conway, B.S., M.Ed., 1967; L. C. McCall, B.S., 1955, 1965. Mildred Gilbert, B.S., M. of H. Ec., 1944, 1965; Janet T. Lakeman, B.S., Huntingdon College; M.S., University of Alabama, 1963, 1968.
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- CALHOUN**  
Anniston A. S. Mathews, B.S., 1941, 1965; Goode Nelson, B.A., University of Alabama, 1945, 1965; L. G. Pair, B.S., M.Ag., 1948, 1965; John D. Sellers, B.S., 1949, 1966. Shirley H. Green, B.S., 1961, 1965; Peggy Sue Dean, B.S., 1967.
- CHAMBERS**  
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- CHEROKEE**  
Centre J. J. Young, B.S., M.S., 1933, 1965; J. B. Butler, B.S., 1954, 1967; Charles R. Moody, B.S., 1964, 1965. Geneva Marshall James, B.S., 1941, 1965; Irene J. Lackey, B.S., 1965, 1967.
- CHILTON**  
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- CHOCTAW**  
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- CLARKE**  
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- CLAY**  
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- CLEBURNE**  
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- CONECUH**  
Evergreen M. H. Huggins, B.S., 1936, 1965; George W. Jackson, B.S., M.S., Tuskegee Institute, 1966; H. J. Oakley, B.S., 1954, 1965. Louise T. Ostrum, B.S., M.Ed., 1957, 1965; Hazel H. Harpe, B.A., Judson College, 1961, 1965.
- COOSA**  
Rockford G. S. Sessions, B.S., M.Ag.Ed., 1955, 1965; Elmer Dowdell, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1957, 1965; Jerry Walls, B.S., 1963, 1965.

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- COVINGTON**  
Andalusia W. H. Kinard, B.S., M.Ag., 1954, 1965; John W. Fryer, B.S., 1964, 1965; Robert E. Linder, B.S., M.Ag., 1960, 1965; C. W. Pike, B.S., M.Ag., 1952, 1965.  
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- CRENSHAW**  
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- CULLMAN**  
Cullman H. G. Pinkston, B.S., 1937, 1965; Billy Ray Baswell, B.S., 1966, 1968; M. T. Whisenant, B.S., 1949, 1965.  
Mary Sue Tillery, B.S., 1947, 1965; Edith Aliene Barnes, B.S., Bob Jones University, 1967; Peggy M. Harris, B.S., Alabama College, 1964, 1965.
- DALE**  
Ozark W. D. Thomason, B.S., 1931, 1965; \*James H. Estes, B.S., 1963, 1965; T. C. Hubbard, B.S., M.Ag., 1936, 1965.  
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- DALLAS**  
Selma L. C. Alsobrook, B.S., 1942, 1965; Alex C. Brown, B.S., Tuskegee Institute; M.S., Indiana University, 1959, 1965; James S. Hines, B.S., 1966; George C. Hoomes, B.S., 1963, 1967; Charles D. Scott, II, B.S., M.Ed., Tuskegee Institute, 1951, 1965.  
Dorothy Hixson, B.S., Alabama College; M.S., University of Tennessee, 1937, 1965; Carolyn L. Hicks, B.S., Tuskegee Institute, 1967; Norma M. McCrory, B.S., University of Southern Mississippi, 1961, 1965.
- DeKALB**  
Ft. Payne F. DeWitt Robinson, B.S., 1949, 1965; C. A. Moore, B.S., 1955, 1965; D. C. Poe, B.S., 1956, 1965; Bob Eugene Spears, B.S., Oklahoma State University; M.S., University of Tennessee, 1964, 1965.  
Mary Louise Walker, B.S., Peabody College, 1954, 1965; Edith A. Barnes, B.S., Bob Jones University, 1967.
- ELMORE**  
Wetumpka J. E. Morriss, B.S., M.S., 1935, 1965; W. E. Davis, B.S., M.S., 1959, 1965; L. Shelton Hawsey, B.S., M.Ed., 1965; Roscoe A. Lee, B.S., M.Ed., Tuskegee Institute, 1947, 1965.  
Le Jean Ford, B.S., Texas State University for Women, 1963, 1967; Judith N. Brown, B.S., 1966; Gwendolyn E. Turner, B.S., Alabama A&M, 1968.
- ESCAMBIA**  
Brewton R. J. Martin, B.S., 1946, 1966; Edward M. Knowles, B.S., M.Ag., 1953, 1965; Barry E. Wood, B.S., 1966, 1967.  
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- ETOWAH**  
Gadsden T. L. Sanderson, B.S., M.S., 1943, 1965; H. J. Jackson, B.S., University of Georgia, 1944, 1965; A. D. Jones, B.S., M.Ag., 1948, 1965.  
Sara L. Thomas, B.S., 1947, 1965; Celeste H. Martin, B.S., M.S., 1957, 1965.
- FAYETTE**  
Fayette Albert Pitts, B.S., M.Ag., 1952, 1965; James Pettus Tucker, B.S., 1961, 1965.  
Annie Mary Hester, B.S., Berry College; M.S., University of Alabama, 1953, 1965; Jean McCracken, B.S., University of Alabama, 1957, 1965.
- FRANKLIN**  
Russellville H. A. Ponder, B.S., 1935, 1965; Ellis Raphord Farrington, B.S., 1964, 1965; H. W. Warren, B.S., 1945, 1965.  
Joyce McNutt, B.S., 1954, 1965; Eleanor R. Coker, B.S., Samford University, 1966.
- GENEVA**  
Geneva R. C. Reynolds, B.S., M.Ag.Ed., 1954, 1965; Claude N. Nall, B.S., 1967; Ted B. Smith, B.S., 1963, 1965.

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- Emily H. Seay, B.S., Alabama College, 1960, 1965; Linda L. Morris, B.S., 1966.
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Eutaw W. H. Johnson, B.S., 1935, 1965; Frank L. Jackson, B.S., M.Ed., Tuskegee Institute, 1941, 1965.  
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- HALE**  
Greensboro J. B. Deavours, B.S., 1937, 1965; Gwinn Russell Ezell, B.S., Alabama A&M College, 1962, 1965; J. N. Glass, B.S., M.Ag., 1948, 1965; Lee Grant Gober, B.S., M.Ag., 1960, 1967.  
Evelyn D. Edwards, B.S., M.S., University of Alabama, 1966; Katie I. Carlton, B.S., Tuskegee Institute, 1950, 1965.
- HENRY**  
Abbeville R. C. Hartzog, B.S., 1946, 1965; C. L. Barefield, B.S., 1951, 1965; Louis A. Murray, B.S., Alabama A&M College, 1962, 1965.  
Margaret O. Eason Kirkland, B.S., Jacksonville State University, 1961, 1965; Rossie T. Farmer, B.S., Langston University, 1967; Jewel W. Hardwick, B.S., 1958, 1967.
- HOUSTON**  
Dothan Allen M. Mathews, B.S., M.Ag., 1957, 1965; Luther J. McGaughey, B.S., M.Ag., 1960, 1965; Marion H. Roney, B.S., 1962, 1965; Reafield Vester, B.S., Alabama A&M College, 1966; J. N. White, B.S., Colorado State University, 1936, 1965.  
Julia Smith, B.S., 1955, 1965; Nancy W. Coon, B.S., 1968; Mildred Mac Ward, B.S., Alabama A&M College; M.Ed., Tuskegee Institute, 1955, 1965.
- JACKSON**  
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- JEFFERSON**  
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- LAMAR**  
Vernon H. H. Lumpkin, B.S., 1950, 1965; C. T. Guthrie, B.S., 1966.  
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- LAUDERDALE**  
Florence L. T. Wagnon, B.S., 1935, 1965; Charles W. Burns, B.S., 1957, 1965; Howard Douglas Hall, B.S., 1962, 1965; Irby J. Harrell, B.S., Berry College, 1963, 1965; Robert T. Hughes, B.S., Alabama A&M College; M.S., Tuskegee Institute, 1958, 1965.  
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- LAWRENCE**  
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Elisabeth Crum, B.S., 1955, 1965; Willie C. Lockhart, B.S., Tuskegee Institute, 1937, 1965; Jo Anna T. Middlebrooks, B.S., 1968.
- LIMESTONE**  
Athens F. K. Agee, B.S., 1945, 1965; Robert Burton, B.S., Alabama A&M College, 1962, 1965; Watkins L. Carter, B.S., Mississippi State University, 1967; F. Macon Patterson, B.S., 1954, 1968.

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- LOWNDES**  
Hayneville J. W. Mathews, B.S., 1933, 1965; Scott Billingsley, B.S., M.S., Tuskegee Institute, 1951, 1965; T. J. Gerald, B.S., M.Ag., 1946, 1965. Mary Maddux, B.S., 1957, 1965; Olean P. Cunningham, B.S., Tuskegee Institute, 1950, 1965.
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Tuskegee J. M. Bolling, B.S., 1939, 1965; Leonard Huffman, B.S., M.Ed., Tuskegee Institute, 1962, 1965; William D. Osborn, B.S., 1966; James L. Smith, B.S., Edward Waters College; M.S., Tuskegee Institute, 1965. Carolyn Brown Williams, B.S., Tuskegee Institute, 1962, 1968.
- MADISON**  
Huntsville R. O. Magnusson, B.S., 1948, 1965; Earl S. Halla, B.S., M.Ag., 1953, 1965; H. L. Hood, 1936, 1965; Warren Q. Scott, B.S., Tuskegee Institute, 1942, 1965; Lee R. Watkins, B.S., 1967. Christine Huber, B.S., Peabody College, 1944, 1965; Jacquelyn B. Outlaw, B.S., Tuskegee Institute, 1968; Barbara Owens, B.S., Florence State College, 1958, 1965.
- MARENGO**  
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- MARION**  
Hamilton H. B. Price, B.S., 1945, 1965; O. Terrill Gonce, B.S., 1965; I. D. Thornton, B.S., M.S., 1944, 1965. Elna Tanner, B.S.; M.S., University of Tennessee, 1950, 1965; Dorothy Jane Tucker, B.S., Florence State College, 1967.
- MARSHALL**  
Guntersville W. L. Martin, B.S., 1942, 1965; R. I. D. Murphy, B.S., M.Ag., 1958, 1965; Franklin H. Wood, B.S., 1963, 1965. Elaine C. Brooks, B.S., Samford University, 1962, 1966; Maxine Johnson, B.S., Florence State College, 1967.
- MOBILE**  
Mobile Charles B. Vickery, B.S., 1948, 1965; W. R. Agerton, B.S., M.Ed., 1965; W. L. Deakle, 1943, 1965; Charles H. Kilpatrick, B.S., 1964, 1965. Mona Whatley, B.S., Peabody College, 1941, 1965; Myra R. Nall, B.S., Alabama College, 1968; Mildred Payne, B.S., 1941, 1965.
- MONROE**  
Monroeville A. V. Culpepper, B.S., 1928, 1965; Mike M. Gamble, B.S., Mississippi State University, 1966; Walter C. Odom, B.S., Tuskegee Institute; M.S., University of Wisconsin, 1938, 1965; James H. Sellers, B.S., 1966. Annie Richardson, A.B., Judson College, 1952, 1965; DeLois Carmichael, B.S., M.Ed., Tuskegee Institute, 1952, 1965; Lois Annette Johnson, University of Southern Mississippi, 1967.
- MONTGOMERY**  
Montgomery T. P. McCabe, B.S., M.Ag., 1939, 1965; Leonard E. Brown, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1964, 1965; Addre Bryant, B.S., Tuskegee Institute, 1954, 1965; Robert R. Moorner, B.S., 1967, 1968; Jack A. Thompson, B.S.; M.S., University of Tennessee, 1957, 1965. Virginia Gilchrist, B.S., University of Alabama; M.S., 1955, 1965; Annie M. Boynton, 1928, 1965; Janis Bea Cottrell, B.S., Huntingdon College, 1967.
- MORGAN**  
Hartselle C.D. Rutledge, B.S., M.Ag., 1948, 1965; Eddie E. Cannon, B.S., Alabama A&M College; M.S., Tuskegee Institute, 1965; H. W. Houston, B.S., M.Ag., 1954, 1965; Jerry L. Parker, B.S., M.Ed., 1960, 1965. Lucile Hawkins, B.S., Alabama College, 1948, 1965; Mary O. Coffey, A.B., Judson College, 1961, 1965; Elouise Lipscomb, 1944, 1965.
- PERRY**  
Marion W. O. Hairston, B.S., M.Ag., 1946, 1965; J. A. Bates, B.S., 1950, 1965; Richard E. Smith, B.S., Alabama A&M College, 1962, 1965. Evelyn Graham, B.S., University of Alabama, 1950, 1965; Hazel I. Patton, B.S., Tuskegee Institute, 1968; Joyce Richardson, B.S., Judson College, 1958, 1965.

- PICKENS**  
Carrollton Edward N. Graham, B.S., M.S., Mississippi State University, 1960, 1966; Thomas J. Dill, B.S., M.S., Mississippi State University, 1962, 1965; Walter D. Powers, B.S., 1966.  
Helen B. Hill, B.S., Alabama College; M.S., University of Alabama, 1941, 1965; Lorraine Meeks, B.S., University of Alabama, 1957, 1965.
- PIKE**  
Troy H. J. Carter, B.S., 1935, 1965; Darell P. Dunn, B.S., 1965; James McLean, B.S., M.Ag.Ed., 1954, 1967.  
Florence Owens, B.S., Florida State University, 1958, 1965; Kay Smith, B.S., Alabama College, 1967.
- RANDOLPH**  
Wedowee Grady M. Wakefield, B.S., M.Ag.Ed., 1957, 1965; T. F. Burnside, Jr., B.S., M.Ed., 1960, 1965; Theodore Shumpert, B.S., M.Ed., Tuskegee Institute, 1946, 1965.  
Wanda E. Prater, B.S., Jacksonville State University, 1965; Barbara K. White, B.A., University of Mississippi, 1966.
- RUSSELL**  
Phenix City C. A. Woods, B.S., 1947, 1965; Mack H. Eldridge, B.S., Virginia State College, 1948, 1965; Jerry Lamar Williams, B.S., 1967.  
Alma Holladay, B.S., M.Ed., 1941, 1965; Elnora Gandy, B.S., Tuskegee Institute, 1952, 1965.
- SHELBY**  
Columbiana W. M. Clark, B.S., 1937, 1965; J. E. Jones, B.S., 1958, 1965; W. J. Thompson, B.S., M.S., 1954, 1965.  
Marian Cotney, B.S., 1939, 1965; Elizabeth Ann Mathis, B.S., Samford University, 1965, 1968.
- ST. CLAIR**  
Pell City H. L. Eubanks, B.S., 1934, 1965; W. D. Jackson, B.S., 1946, 1965; J. E. Yates, B.S., 1955, 1965.  
Aileen Puckett, B.S., M.S., University of Alabama, 1957, 1965; Louise S. Littlejohn, B.S., University of Alabama, 1967.
- SUMTER**  
Livingston B. B. Williamson, B.S., M.Ag., 1946, 1966; F. W. Kilgore, B.S., 1954, 1965; Joe E. Lashley, B.S., M.Ag., 1965; Henry J. Spears, B.S., Alabama A&M College; M.Ed., Tuskegee Institute, 1946, 1965.  
Mildred Ennis, B.S., University of Tennessee, 1958, 1965; Theresa E. Threadgill, B.S., Tuskegee Institute, 1957, 1965.
- TALLADEGA**  
Talladega Thomas L. Bass, B.S., M.Ed., 1946, 1966; A. A. Hester, B.S., 1944, 1965; J. B. Mathews, B.S., 1949, 1965; Curtis H. O'Daniel, B.S., 1965, 1966; George A. Peasant, B.S., Tuskegee Institute; M.S., Virginia State College, 1950, 1965.  
Martha J. Owens Sprayberry, B.S., 1966; Marie H. Player, B.S., Alabama A&M College; M.Ed., Tuskegee Institute, 1957, 1965.
- TALLAPOOSA**  
Dadeville C. H. Webb, B.S., 1957, 1965; James L. McGhee, B.S., Alabama A&M College; M.Ed., Tuskegee Institute, 1968; James E. Pinion, B.S., 1966; R. W. Thompson, B.S., M.Ag.Ed., 1958, 1965.  
Margaret Miller, B.S., 1949, 1965; Iris E. Anderson, B.S., Alabama College, 1965; Annette B. Wallace, B.S., Alabama A&M College, 1966.
- TUSCALOOSA**  
Tuscaloosa B. R. Holstrun, B.S., 1934, 1965; James Cooper, B.S., 1948, 1965; B. B. Fields, B.S., Tuskegee Institute; M.S., University of Illinois, 1954, 1965; James C. Howell, B.S., M.Ag.Ed., 1961, 1965; French Sconyers, B.S., 1943, 1965.  
Elizabeth Stewart, B.S.; M.S., University of Alabama, 1945, 1965; LaVurn Blount Stinson, B.S., Alabama A&M College, 1965; Mrs. O'Neal Massey, B.S.; M.S., University of Alabama, 1952, 1965; Sarah N. Watson, B.S., M.S., University of Alabama, 1961, 1965.
- WALKER**  
Jasper Robert E. Thornton, B.S., M.Ag., 1954, 1965; Jerry B. Clark, B.S., M.Ed., 1965; W. D. Jones, B.S., M.Ag., 1954, 1965.  
Jeanette Argo, B.S., Alabama College; M.S., University of Alabama, 1942, 1965; Margaret P. Gray, B.S., University of Alabama, 1966; Mary Linda Maughan, B.S., Mississippi State College for Women, 1967.
- WASHINGTON**  
Chatom D. O. Estes, B.S., 1949, 1965; Kenneth W. Barlow, B.S., 1968.  
Sarah H. Hazen, B.S., 1964, 1965; Patricia Ann Taylor, B.S., University of Alabama, 1968.

- WILCOX** Robert C. Farquhar, B.S., M.S., 1949, 1965; Richard E. Cobb, B.S.,  
Camden Tuskegee Institute, 1968; W. J. Hardy, B.S., 1954, 1965.  
Margaret Whatley, B.S.; M.S., University of Alabama, 1941, 1965;  
Solonia E. Reynolds, B.S., Alabama A&M College; M.Ed., Tuskegee  
Institute, 1949, 1965.
- WINSTON** W. L. Richardson, B.S., 1935, 1965; J. E. Fields, B.S., 1949, 1965.  
Double Springs Madge Pennington, B.S., 1941, 1965.



## ENGINEERING EXPERIMENT STATION STAFF

HARRY M. PHILPOTT, A.B., Ph.D., D.D., LL.D., *President*  
 BEN T. LANHAM, JR., B.S., M.S., Ph.D., *Vice President for Research*  
 J. GRADY COX, B.S.Ch.E., M.S., Ph.D., (P.E.), *Director*  
 WILLIAM C. JONSON, JR., B.S., *Assistant Director*

### Aerospace Engineering

- PITTS, ROBERT G. *Head of Department (P.E.), 1935, 1944*  
 B.A.E., Auburn University; M.S., California Institute of Technology.
- SFORZINI, RICHARD H. *Professor, 1966, 1967*  
 B.S., U.S. Military Academy; Degree of Mechanical Engineering, Massachusetts Institute of Technology.
- BENNETT, ARTHUR G. *Associate Professor, 1968*  
 B.S., University of Michigan; M.S., Ph.D., Purdue University.
- CUTCHINS, MALCOLM A. *Associate Professor (P.E.), 1956, 1962*  
 B.S.C.E., M.S.E.M., Ph.D., Virginia Polytechnic Institute.
- DRUMMOD, ALASTAIR M. *Associate Professor, 1967*  
 B.A.Sc., University of British Columbia; D.C.A.E., College of Aeronautics, Cranfield England; M.A.Sc., University of British Columbia; Ph.D., University of Toronto.
- HARWELL, KENNETH E. *Associate Professor, 1963*  
 B.S., University of Alabama; M.S., Ph.D., California Institute of Technology.
- BURKHALTER, JOHNNY E. *Assistant Professor, 1968*  
 B.A.E., M.S., Auburn University.
- PELL, KYNRIC M. *Assistant Professor, 1968*  
 B.A.S.E., M.S., Ph.D., University of Florida.
- CULBERSON, ROBERT N. *Instructor, 1968*  
 B.A.E., M.S.A.E., Auburn University.

### Chemical Engineering

- WINGARD, ROBERT E. *Head of Department, 1932, 1963*  
 B.S., M.S., Auburn University.
- HSU, CHENG-TEH *Professor, 1953, 1962*  
 B.S.C., University of Nanking; M.S., University of Wisconsin; Ph.D., University of Pennsylvania.

### Civil Engineering

- BRANSFORD, THOMAS L. *Professor (P.E.), 1965*  
 B.E., C.E., Vanderbilt University.
- HUDSON, FRED M. *Professor (P.E.), 1947, 1961*  
 B.S.C.E., Purdue University; M.S., Princeton University.
- POPOVICS, SANDOR *Professor (P.E.), 1959*  
 Diploma, Polytechnic University, Budapest; Candidate of Tech. Sciences, National Academy of Sciences, Budapest; Ph.D., Purdue University.
- KRISHNAMURTHY, N. *Associate Professor, 1967*  
 Intermediate in Science, St. Joseph's College, Bangalore, India; B.Sc., Central College, Bangalore, India; B.E. (Civil) National Institute of Engineering, Mysore, India; M.S. (CE), Ph.D., University of Colorado.
- JUDKINS, JOSEPH F., JR. *Assistant Professor, 1967*  
 B.S.C.E., M.S.S.E., Ph.D., Virginia Polytechnic Institute.
- PETERSON, CHARLES H. *Assistant Professor (P.E.), 1962*  
 B.C.E., M.C.E., Auburn University.
- RAMEY, GEORGE E. *Instructor, 1965*  
 B.S.C.E., M.S.C.E., Auburn University.

### Electrical Engineering

- HOLMES, CHARLES H. *Head of Department, 1957, 1966*  
 B.E.E., Auburn University; M.E.E., Brooklyn Polytechnic Institute; Ph.D., Stanford University.
- GRAF, EDWARD R. *Alumni Professor, 1957, 1967*  
 B.E.E., M.E.E., Auburn University; Ph.D., Technische Hochschule, Stuttgart.

HONNELL, MARTIAL A.	Professor (P.E.), 1958
B.S.E.E., M.S.E.E., E.E., Georgia Institute of Technology.	
LOWRY, JAMES L.	Professor (P.E.), 1955, 1965
B.E.E., M.E.E., Auburn University; Ph.D., University of Florida.	
PHILLIPS, CHARLES L.	Professor, 1959, 1965
B.E.E., M.S.E.E., Ph.D., Georgia Institute of Technology.	
CARROLL, CHESTER C.	Associate Professor, 1965
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.	
HICKMAN, CHARLES E.	Associate Professor, 1966
B.S.E.E., M.S.E.E., Ph.D., University of Tennessee.	
FEASTER, WILLIAM M.	Associate Professor, 1956, 1965
B.S.E.E., M.S.E.E., Auburn University.	
NICHOLS, GROVER T.	Associate Professor (P.E.), 1947, 1950
B.E.E., Auburn University; M.S., Georgia Institute of Technology.	
SLAGH, TIM D.	Associate Professor, 1958, 1965
B.S., Michigan College of Mining and Technology; M.S., Auburn University.	
BOLAND, JOSEPH S. III.	Assistant Professor, 1961, 1968
B.S.E.E., M.S.E.E., Auburn University; Ph.D., Georgia Institute of Technology.	
JAMES, SYDNEY N.	Assistant Professor, 1966
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.	
MILLER, HAMPTON	Assistant Professor, 1963
B.S.E.E., Auburn University.	
ROGERS, CHARLES L.	Assistant Professor, 1961, 1964
B.E.E., M.S., Auburn University; Ph.D., Duke University.	
BURGE, WALLACE W.	Instructor, 1966, 1967
B.S.E.E., Auburn University.	
CARTER, MARION B.	Instructor, 1967
B.S., M.S., University of Tennessee.	
CHENOWETH, DARRELL L.	Instructor, 1963, 1967
B.E.E., General Motors Institute; M.S.E.E., Auburn University.	
COLEMAN, ROBERT J.	Instructor, 1964, 1967
B.S.E.E., M.S., Auburn University.	
DEFFEBACH, HARRY L.	Instructor, 1963, 1967
B.E.E., M.S., Auburn University.	
DOUGLAS, WALTER B., JR.	Instructor, 1967
B.E.E., Georgia Institute of Technology; M.S., Auburn University.	
DWIVEDI, NARENDRA P.	Instructor, 1966, 1967
I.Sc., L.S. College, Muzaffarpur, India; B.Sc., Bihar Institute of Technology, Sindri, India; M.E., Texas A&M University.	
FAHEY, MICHAEL D.	Instructor, 1968
B.S., M.S., Auburn University.	
FAUST, WILLIAM E.	Instructor, 1961, 1966
B.S., M.S., Auburn University.	
FORD, FRED A.	Instructor, 1963, 1967
B.S., University of Mississippi; M.S., Auburn University.	
HOPKINS, WALTER C.	Instructor, 1967
B.S.E.E., University of Alabama.	
JOHNSON, JOHN C.	Instructor, 1966, 1967
B.S.E.E., Auburn University.	
JOHNSON, PIERCE, JR.	Instructor, 1965, 1967
B.S.E.E., M.S.E.E., Georgia Institute of Technology.	
JONES, JAMES W.	Instructor, 1963, 1967
B.E.E., M.S. (EE), Auburn University.	
KELLY, DONALD W.	Instructor, 1964, 1967
B.S., M.S., Mississippi State University.	
KULAS, CHRISTOPHER E.	Instructor, 1968
B.S.E.E., General Motors Institute; M.S., Auburn University.	
PADGETT, WILLIAM T.	Instructor, 1967
B.S.E.E., Auburn University.	

- PETTUS, ROBERT O. \_\_\_\_\_ *Instructor, 1967*  
B.S.E.E., M.S.E.E., Auburn University.
- SIMS, ROBERT J. \_\_\_\_\_ *Instructor, 1964, 1967*  
B.E.E., M.S.E.E., Auburn University.

## Industrial Engineering

- BROOKS, GEORGE H. \_\_\_\_\_ *Head of Department (P.E.), 1966*  
B.I.E., Florida State University; M.S.I.E., Ph.D., Georgia Institute of Technology.
- HERRING, BRUCE E. \_\_\_\_\_ *Assistant Professor (P.E.), 1965*  
B.I.E., Ohio State University; M.S.M.E., New Mexico State University.
- HOOL, JAMES N. \_\_\_\_\_ *Associate Professor, 1965, 1967*  
B.S., M.S., Ph.D., Purdue University.
- MORGAN, WILLIAM W. \_\_\_\_\_ *Associate Professor, 1954, 1965*  
B.B.A., University of Georgia; M.S.I.M., Georgia Institute of Technology.
- TRUCKS, LOUIS B. \_\_\_\_\_ *Assistant Professor (P.E.), 1964*  
B.S., Auburn University; M.S., University of Pittsburgh.

## Industrial Laboratories

- HAYNES, LUTHER J. \_\_\_\_\_ *Head of Department, 1945, 1962*  
B.S., M.S., Auburn University; Ed.D., Bradley University.

## Mechanical Engineering

- VESTAL, DONALD M., JR. \_\_\_\_\_ *Head of Department (P.E.), 1959*  
B.S.M.E., B.S.E.E., M.S.M.E., Texas A&M University; Ph.D., Stanford University.
- BUSSELL, WILLIAM H. \_\_\_\_\_ *Professor, 1965*  
B.M.E., M.S.E., University of Florida; Ph.D., Michigan State University.
- JEMIAN, WARTAN A. \_\_\_\_\_ *Professor (P.E.), 1962, 1965*  
B.S.Ch., University of Maryland; M.S., Ph.D., Metallurgical Engineering, Rensselaer Polytechnic Institute.
- JONES, EDWARD O., JR. \_\_\_\_\_ *Professor and Assistant Head Professor (P.E.), 1946, 1965*  
B.M.E., B.E.E., Auburn University; M.S., University of Illinois.
- LAWSON, STANTON C.D. \_\_\_\_\_ *Professor (P.E.), 1958, 1963*  
B.S.Sc., University of Toronto; M.S., University of Michigan.
- MAYNOR, HAL W. \_\_\_\_\_ *Professor (P.E.), 1959*  
B.S., M.S., D. of Engineering, University of Kentucky.
- SHAW, WINFRED A. \_\_\_\_\_ *Professor (P.E.), 1958*  
B.S.G.E., University of Mississippi; M.S.E.M., University of Texas; Ph.D., Stanford University.
- SWINSON, WELDON F. \_\_\_\_\_ *Professor, 1964, 1967*  
B.A., Rice University; B.S.M.E., Texas Technological College; M.S.M.E., Texas A&M University; Ph.D., University of Illinois.
- VACHON, REGINALD I. \_\_\_\_\_ *Alumni Professor, 1958, 1967*  
B.M.E., M.S.N.S., Auburn University; Ph.D., Oklahoma State University.
- DUNN, JERRY R. \_\_\_\_\_ *Assistant Professor, 1966*  
B.S.M.E., Lamar State College of Technology; M.S.M.E., Georgia Institute of Technology.
- DYER, DAVID F. \_\_\_\_\_ *Assistant Professor, 1965*  
B.S.M.E., University of Tennessee; M.S.M.E., Ph.D., Georgia Institute of Technology.
- HARMON, GRADY R. \_\_\_\_\_ *Assistant Professor, 1963, 1965*  
B.E.P., M.S., Auburn University.
- LEPPERT, ALFRED M. \_\_\_\_\_ *Assistant Professor (P.E.), 1965*  
B.M.E., Georgia Institute of Technology; M.S., Stanford University.
- MAPLES, GLENNON \_\_\_\_\_ *Assistant Professor, 1966*  
B.S., M.S., Mississippi State University; Ph.D., Oklahoma State University.
- YU, JAMES C. M. \_\_\_\_\_ *Assistant Professor, 1963, 1967*  
B.S., National Taiwan University; M.S., Virginia Polytechnic Institute; Ph.D., Auburn University.
- BUSCH, COURTNEY C. \_\_\_\_\_ *Instructor, 1965*  
B.S., M.S., Tulane University.
- NIX, HILLIARY G. \_\_\_\_\_ *Instructor, 1964, 1966*  
B.S.M.E., M.S.M.E., Auburn University.

- RANSON, WILLIAM F., JR. \_\_\_\_\_ *Instructor, 1967*  
 B.S.M.E., M.S.M.E., Auburn University.
- TERRILL, ALAN R. \_\_\_\_\_ *Instructor, 1966*  
 B.S., M.E., Pennsylvania State University.

## Textile Engineering

- ADAMS, CLEVELAND L. \_\_\_\_\_ *Head of Department, 1952*  
 B.T.E., Auburn University.
- WATERS, WILLIAM T. \_\_\_\_\_ *Professor, 1958, 1963*  
 B.S.T.E., Clemson University; M.S., Georgia Institute of Technology.
- FARROW, JAMES C. \_\_\_\_\_ *Associate Professor (P.E.), 1949, 1965*  
 B.S.T.E., Auburn University.
- HALL, DAVID M. \_\_\_\_\_ *Associate Professor, 1965*  
 B.T.C., Auburn University; M.S.T.C., Clemson University; Ph.D., Victoria University (England).
- MORTON, GLENN P. \_\_\_\_\_ *Assistant Professor, 1967*  
 B.S., McMurry College; M.S., Auburn University.

## ENGINEERING EXTENSION SERVICE

- HARRY M. PHILPOTT, A.B., Ph.D., D.D., LL.D., *President*
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- J. GRADY COX, B.S.Ch.E., M.S., Ph.D. (P.E.), *Dean, School of Engineering*
- JOHN L. CAIN, B.Ch.E., *Director*
- JAMES F. O'BRIEN, JR., B.M.E., M.M.E., *Assistant Director*
- WILLIAM B. SANFORD, B.M.E., M.M.E., *Director, Birmingham Office*
- BILLY R. MANNING, B.S., *Director, Civil Defense Professional Advisory Center*

## Aerospace Engineering

- DECKER, HAROLD R. \_\_\_\_\_ *Assistant Professor of Aerospace Engineering, 1965*  
 B.S.Ed., Northeast Missouri State Teachers College; M.Litt., University of Pittsburgh.
- KITELY, GARY W. \_\_\_\_\_ *Assistant Professor of Aerospace Engineering, 1965*  
 B.S., University of Minnesota; M.S., Purdue University; F.A.A., A & P Certificate, Parks College.
- ROBINSON, WALTER J., JR. \_\_\_\_\_ *Associate Professor of Aerospace Engineering, 1959, 1966*  
 B.S.A.A., Auburn University; M.B.A., University of Denver.

## Chemical Engineering

- ASKEW, WILLIAM C. \_\_\_\_\_ *Assistant Professor, 1968, 1968*  
 B.S., M.S., Auburn University; Ph.D., University of Florida.
- VIVES, DONALD L. \_\_\_\_\_ *Assistant Professor, 1953, 1968*  
 B.S., M.S., Columbia University.

## Civil Engineering

- BLAKNEY, WILLIAM G. G. \_\_\_\_\_ *Associate Professor of Civil Engineering (P.E.), 1958, 1961*  
 B.E., Nova Scotia Technical College; M.Sc., Ohio State University.
- BRANSFORD, THOMAS L. \_\_\_\_\_ *Professor of Civil Engineering (P.E.), 1965*  
 B.E., C.E., Vanderbilt University.
- JUDKINS, JOSEPH F., JR. \_\_\_\_\_ *Assistant Professor, 1967, 1968*  
 B.S.C.E., M.S.S.E., Ph.D., Virginia Polytechnic Institute.
- PETERSON, CHARLES H. \_\_\_\_\_ *Assistant Professor of Civil Engineering (P.E.), 1962*  
 B.C.E., M.C.E., Auburn University.
- POPOVICS, SANDOR \_\_\_\_\_ *Professor of Civil Engineering (P.E.), 1959*  
 Diploma, Polytechnic University, Budapest; Candidate of Tech. Science, National Academy of Sciences, Budapest; Ph.D., Purdue University.

## Electrical Engineering

- CARROLL, CHESTER, C. \_\_\_\_\_ *Professor, 1966, 1968*  
 B.S.E.E., M.S.E.E., Ph.D., University of Alabama.

- FEASTER, WILLIAM M. Associate Professor of Electrical Engineering, 1956, 1965  
B.S.E.E., M.S.E.E., Auburn University.
- LOWRY, JAMES LEE Professor of Electrical Engineering, 1955, 1965  
B.E.E., M.E.E., Auburn University; Ph.D., University of Florida.
- PHILLIPS, CHARLES L. Professor of Electrical Engineering, 1959, 1965  
B.E.E., M.S.E.E., Ph.D., Georgia Institute of Technology.

## Industrial Engineering

- LAYFIELD, CLAUDE B. Associate Professor of Industrial Engineering  
(P.E.), 1947, 1958  
B.A.A., B.I.M., Auburn University; M.S., Georgia Institute of Technology.
- TRUCKS, LOUIS B. Assistant Professor of Industrial Engineering (P.E.), 1964  
B.S., Auburn University; M.S., University of Pittsburgh.

## Industrial Laboratories

- MCMURTRY, THOMAS EDWARD Assistant Professor of Industrial Laboratories, 1959, 1963  
B.S., M.Ed., Auburn University.

## Mechanical Engineering

- DYER, DAVID F. Assistant Professor, 1965, 1968  
B.S.M.E., University of Tennessee; M.S.E.E., Ph.D., Georgia Institute of Technology.
- JEMIAN, WARTAN A. Professor of Mechanical Engineering (P.E.), 1962, 1965  
B.S.Ch., University of Maryland; M.S., Ph.D., Metallurgical Engineering, Rensselaer Polytechnic Institute.
- TANGER, GERALD Professor, 1958, 1968  
B.S., South Dakota School of Mines and Technology; M.S., Brown University; Ph.D., Oklahoma State University.
- VACHON, REGINALD I. Alumni Associate Professor of Mechanical Engineering, 1958, 1963  
B.M.E., M.S.N.S., Auburn University; Ph.D., Oklahoma State University.

## Textile Engineering

- ADAMS, CLEVELAND L. Head Professor of Textile Technology, 1952  
B.T.E., Auburn University.
- FARROW, JAMES C. Associate Professor of Textile Engineering  
(P.E.), 1949, 1965  
B.S.T.E., Auburn University.

# STATE REGULATORY AND VETERINARY SERVICES

## STATE REGULATORY SERVICE

### CHEMISTRY

COLBURN, C. B.	State Chemist, 1968
B.S., Kansas State College; Ph.D., University of Utah.	
CHERRY, GLENDA B.	Secretary, 1968
GUTHRY, MILFORD DALTON	Chief Chemist III, 1966
B.S., M.S., Auburn University.	
RHOADES, REGINA A.	Agricultural Chemist II, 1961, 1967
B.S., Auburn University.	
JORDAN, DARBY	Agricultural Chemist II, 1966, 1968
HAYES, MELVIN	Agricultural Chemist II, 1966, 1968
HAYES, ROSE MAE	Agricultural Chemist I, 1967
B.S., Florence State University.	
DAVIDSON, PRISCILLA P.	Agricultural Chemist I, 1968
B.S., Auburn University.	
JINKS, JOHN	Assistant Agricultural Chemist, 1968
Two years, Auburn University.	

## STATE VETERINARY DIAGNOSTIC LABORATORY

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GREENE, JAMES E.	Dean, School of Veterinary Medicine, 1937, 1958
D.V.M., M.S., Auburn University.	
MILLIGAN, JOHN G.	State Veterinarian, 1951
B.S., D.V.M., Auburn University.	
TAYLOR, JULIAN B.	Associate State Veterinarian, 1945
D.V.M., Auburn University.	
ROBERTS, CHARLES S.	In Charge of State Diagnostic Laboratory, 1947, 1958
D.V.M., Auburn University; M.S., Michigan State University.	
BRUBAKER, JOYCE	Secretary, State Diagnostic Laboratory, 1968
NICHOLSON, LINDA	Bacteriologist, State Diagnostic Laboratory, 1968
WORTHY, MARY	Laboratory Assistant II, State Diagnostic Laboratory, 1959
ALLEY, J. LEE	Epidemiologist, U.S. Dept. of Agriculture, Agricultural Research Service, D.V.M., 1967
CHRISSENBERRY, C. C.	Brucellosis Epidemiologist, U.S. Dept. of Agriculture, Agricultural Research Service, D.V.M., 1966
EMBRICK, V. R.	U.S. Dept. of Agriculture, Agricultural Research Service, In Charge of Bang's Disease Laboratory, 1949
DAVIDSON, SANDRA	Secretary, State Federal Bang's Disease Laboratory, 1964
JACKSON, DOROTHY B.	Laboratory Assistant II, State Federal Bang's Disease Laboratory, 1964
WILLIAMSON, O. B.	U.S. Dept. of Agriculture, Agricultural Research Service, Biological Laboratory Aide, 1955
WILLIAMSON, RUTH	U.S. Dept. of Agriculture, Agricultural Research Service, Biological Laboratory Aide, 1957
LITTLE, FLETCHER C.	U.S. Dept. of Agriculture, Agricultural Research Service, Biological Laboratory Aide, 1964



- LONG, IRL RICHARD, JR. .... *Bacteriologist, 1966*  
A.B., Huntingdon College.
- POOLE, JAMES H. .... *In Charge of State Branch Veterinary Diagnostic*  
*Laboratory, Albertville, Alabama, 1964*  
D.V.M., Auburn University.
- EDWARDS, SPENCER C. .... *Bacteriologist, State Branch Veterinary*  
*Diagnostic Laboratory, Albertville, Alabama, 1964*  
B.S., Huntingdon College.
- MC CREARY, V. D. .... *In Charge of State Branch Veterinary Diagnostic*  
*Laboratory, Elba, Alabama, 1960*  
D.V.M., Auburn University.
- MOODY, HAROLD M. .... *Bacteriologist, State Branch Veterinary Diagnostic*  
*Laboratory, Elba, Alabama, 1955, 1962*  
B.S., Troy State University.
- TAYLOR, GRACE .... *Secretary, State Branch Veterinary Diagnostic*  
*Laboratory, Elba, Alabama, 1962*
- WHITTEN, VERLON .... *Clerk Typist, State Branch Veterinary Diagnostic*  
*Laboratory, Albertville, Alabama, 1964*
- TOLBERT, SUE .... *Laboratory Assistant I, State Branch Veterinary*  
*Diagnostic Laboratory, Albertville, Alabama, 1955*



DIVISION AND COURSE													
School of Engineering													
Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Total	
M	W	M	W	M	W	M	W	M	W	M	W	M	W
Aerospace Engineering													
		58	1	73		81	1			1		212	2
Aviation Management													
		39		107		136						283	2
Chemical Engineering													
10		44		43	1	36	1					133	
Civil Engineering													
		22		78		57						157	
Electrical Engineering													
		73		158		149				2	1	382	1
Industrial Engineering													
		24		100	1	88				3		215	1
Industrial Management													
						2				1		2	1
Mechanical Engineering													
		54		77		62						193	
Metallurgical Engineering													
		1		6		2	2					9	2
Pre-Chemical Engineering													
48		1		1								49	
Pre-Engineering													
771	3	224										996	3
Pre-Engineering Management													
74	2	126	1									200	3
Textile Chemistry													
		17	1	1		2						3	
Textile Management													
		1		49		45	1					111	2
Textile Science													
		1		6		4						11	
TOTAL													
903	5	684	3	699	2	664	5			6	2	2956	17
Graduate School													
TOTAL (Engineering)													
												114	1
												3070	18
School of Home Economics													
Home Economics		122	1	100	1	81	3	64		1	4	6	371
Nursing		4										5	5
Science				1						1	4	6	376
TOTAL		126	1	101	1	81	3	64				3	27
												9	403
Graduate School													
TOTAL (Home Economics)													
School of Arts and Sciences													
													30
													1

Table 1—Enrollment by Classes, Courses and Divisions—Continued

DIVISION AND COURSE	Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Total	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Pre-Veterinary Medicine	66	16	38	2	19	1	2				6		131	19
Psychology	17	26	15	17	22	7	14	6			1		69	56
General Curriculum	78	103	38	39	13	5	1				3	2	133	149
Sociology	3	23	5	28	12	19	14	22					34	92
Speech	4	4	5	8	12	6	9	7					30	25
TOTAL	499	330	362	193	311	136	263	114			14	5	1449	778
									Graduate School				304	102
									TOTAL (Arts and Sciences)				1753	880
School of Pharmacy														
Pre-Pharmacy	48	16	3		79	17	71	10	45	5			51	16
Pharmacy	8	3	66	25	79	17	71	10	45	5			269	60
TOTAL	56	19	69	25	79	17	71	10	45	5			320	76
									Graduate School				3	1
									TOTAL (Pharmacy)				323	77
School of Veterinary Medicine														
Veterinary Medicine			96	4	99	4	86	5	89	1	1		371	14
TOTAL			96	4	99	4	86	5	89	1	1		371	14
									Graduate School				15	2
									TOTAL (Veterinary Medicine)				386	16
TRANSIENTS														
TOTAL	1	1	2	1	1	3		3	Graduate School		2	1	6	9
									TOTAL (Transients)				10	6
GRAND TOTAL (Undergraduates)	2235	1169	1992	951	2260	906	2005	785	156	6	60	72	8708	3889
									TOTAL GRADUATE SCHOOL				1105	349
									TOTAL ALL COLLEGE				9811	4238
TOTAL MEN AND WOMEN	3404		2943		3166		2790		162		132		14,049	

Table II—Enrollment of Alabama Students by Counties

County	FALL QUARTER, 1968		
	Men	Women	Total
Autauga .....	48	27	75
Baldwin .....	121	36	157
Barbour .....	41	31	72
Bibb .....	17	8	25
Blount .....	43	13	56
Bullock .....	29	14	43
Butler .....	49	19	68
Calhoun .....	129	42	171
Chambers .....	174	80	254
Cherokee .....	15	6	21
Chilton .....	41	12	53
Choctaw .....	12	6	18
Clarke .....	36	22	58
Clay .....	40	16	56
Cleburne .....	21	6	27
Coffee .....	91	28	119
Colbert .....	65	15	80
Concuh .....	29	11	40
Coosa .....	41	13	54
Covington .....	96	59	155
Crenshaw .....	31	14	45
Cullman .....	75	43	116
Dale .....	81	24	105
Dallas .....	99	44	143
DeKalb .....	66	40	106
Elmore .....	97	52	149
Escambia .....	61	27	88
Etowah .....	152	76	228
Fayette .....	21	6	27
Franklin .....	24	12	36
Geneva .....	51	22	73
Greene .....	7	4	11
Hale .....	17	11	28
Henry .....	43	21	64
Houston .....	149	49	198
Jackson .....	59	18	77
Jefferson .....	1140	632	1772
Lamar .....	8	3	11
Lauderdale .....	77	14	91
Lawrence .....	30	3	33
Lee .....	920	413	1333
Limestone .....	35	16	51
Lowndes .....	22	9	31
Macon .....	33	24	57
Madison .....	290	131	421
Marengo .....	44	15	59
Marion .....	34	5	39
Marshall .....	90	44	134
Mobile .....	312	159	471
Monroe .....	44	15	59
Montgomery .....	814	365	1179
Morgan .....	116	60	176
Perry .....	18	8	26
Pickens .....	19	10	29
Pike .....	45	15	60
Randolph .....	59	34	93
Russell .....	114	30	144
St. Clair .....	36	15	51
Shelby .....	49	28	77
Sumter .....	19	3	22
Talladega .....	102	64	166
Tallapoosa .....	196	84	280
Tuscaloosa .....	29	9	38
Walker .....	43	22	65
Washington .....	13	7	20
Wilcox .....	25	10	35
Winston .....	16	5	21
TOTAL (Alabama) .....	6961	3179	10,140

Table III—Enrollment of Students by States and Territories

State	FALL QUARTER, 1968		Totals
	Men	Women	
Alaska .....	1	0	1
Arkansas .....	10	2	12
Arizona .....	2	1	3
California .....	16	9	25
Colorado .....	5	1	6
Connecticut .....	11	1	12
Delaware .....	1	2	3
District of Columbia .....	2	2	4
Florida .....	576	190	766
Georgia .....	913	416	1329
Muscogee, Georgia .....	170	99	269
Hawaii .....	3	1	4
Idaho .....	0	1	1
Illinois .....	13	6	19
Indiana .....	12	3	15
Iowa .....	6	1	7
Kansas .....	3	1	4
Kentucky .....	93	13	106
Louisiana .....	61	16	77
Maine .....	1	0	1
Maryland .....	39	10	49
Massachusetts .....	6	2	8
Michigan .....	7	2	9
Minnesota .....	5	2	7
Mississippi .....	129	33	162
Missouri .....	7	2	9
Montana .....	1	0	1
Nebraska .....	1	1	2
New Hampshire .....	1	0	1
New Jersey .....	32	10	42
New Mexico .....	8	2	10
New York .....	40	9	49
North Carolina .....	40	15	55
North Dakota .....	2	0	2
Ohio .....	20	4	24
Oklahoma .....	8	2	10
Oregon .....	2	0	2
Pennsylvania .....	27	2	29
Rhode Island .....	2	0	2
South Carolina .....	60	21	81
South Dakota .....	1	2	3
Tennessee .....	272	103	375
Texas .....	38	10	48
Utah .....	3	0	3
Vermont .....	2	0	2
Virginia .....	68	37	105
Washington .....	5	1	6
West Virginia .....	7	2	9
Wisconsin .....	5	1	6
TOTAL—Other States .....	2737	1038	3775
TOTAL—All States .....	9698	4217	13,915
United States Territories			
Canal Zone .....	0	2	2
Puerto Rico .....	3	0	3
TOTAL—U. S. Territories .....	3	2	5



**Table IV—Enrollment of Students by Foreign Country**

Foreign Country	FALL QUARTER, 1968		
	Men	Women	Total
Afghanistan .....	1	0	1
Bahamas .....	2	0	2
Brazil .....	1	0	1
Canada .....	2	0	2
China .....	34	10	44
Costa Rica .....	1	0	1
Egypt .....	1	0	1
El Salvador .....	2	0	2
England .....	1	0	1
Greece .....	2	0	2
Hong Kong .....	6	3	9
India .....	25	4	29
Indonesia .....	3	0	3
Iran .....	8	0	8
Iraq .....	1	1	2
Israel .....	1	0	1
Japan .....	1	0	1
Jordan .....	2	0	2
Korea .....	7	0	7
Lebanon .....	1	0	1
Mexico .....	1	0	1
Pakistan .....	2	0	2
Paraguay .....	2	0	2
Thailand .....	1	1	2
Turkey .....	1	0	1
Venezuela .....	1	0	1
TOTALS—Foreign Countries .....	110	19	129
TOTAL STUDENTS ENROLLED			
Fall Quarter, 1968 .....	9811	4238	14,049

**General Summary of Enrollment****SUMMER, FALL, AND WINTER, 1968-69 (as of March 1, 1969)**

Total Enrollment on Auburn Campus .....	14,049
Correspondence Study .....	800
Clinics, Conferences, Seminars & Short Courses .....	9,352
Montgomery Center (Credit) .....	373
Montgomery Center (Non-Credit) .....	165
GRAND TOTAL .....	24,739

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Auburn Computer Center	171	Basic Quarterly Charges	31
Auburn Union	41	Other Fees and Charges	32
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